CHIEF INFORMATION OFFICER

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DEC 0 8 2022

MEMORANDUM FOR CHAIRMAN OF THE JOINT CHIEFS OF STAFF
                UNDER SECRETARIES OF DEFENSE
                CHIEFS OF THE MILITARY SERVICES
                COMMANDERS OF THE COMBATANT COMMANDS
                GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
                DIRECTOR OF COST ASSESSMENT AND PROGRAM
                    EVALUATION
                DEFENSE INFORMATION SYSTEMS AGENCY

SUBJECT: Enterprise Satellite Communications Management and Control Implementation Plan

References: (a) DoD Digital Modernization Strategy, July 2019
               (b) United States Space Force Vision for Satellite Communications, January 2020

      The Enterprise Satellite Communications (SATCOM) Management and Control (ESC-MC) Implementation Plan, in support of the Department of Defense's Digital Modernization Strategy and the United States Space Force Vision for Satellite Communications, will facilitate United States Space Command's role as the Global SATCOM Manager by delivering operationally relevant SATCOM resource planning and allocation.

      The ESC-MC Implementation Plan also provides the foundational capabilities necessary for the on-going Future SATCOM Force Design, including increased reliance on commercial SATCOM and stronger partnerships with our Allies, as the Department builds out and executes Joint All Domain Command and Control (JADC2).

      DoD Components are expected to appropriately resource capabilities outlined in the implementation plan through deliberate planning, programming and budgeting.

      My point of contact for the implementation plan is Mr. Michael R. Dean, michael.r.dean14.civ@mail.mil, (571) 372-4938.

John B. Sherman

Attachment:
As Stated

Department of Defense

Enterprise SATCOM Management and Control (ESC-MC) Implementation Plan

October 20, 2022

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FOREWORD

The global threat landscape is constantly evolving and remaining competitive and modernizing our digital environment is imperative for the Department of Defense (DoD) to meet challenges not only from great powers and regional adversaries, but also from violent and criminal non-state actors and extremists. We must act now to secure our future. The *Department of Defense (DoD) Digital Modernization Strategy* recognizes this and calls for the following action in DoD Satellite Communications (SATCOM) as part of its approach to "strengthen overall adoption of enterprise systems to expand the competitive space in the digital arena":

Goal 1: Innovate for a Competitive Advantage
Objective 3: Modernize Warfighter Command, Control, Communications,
and Computers (C4) Infrastructure and Systems - Formalize and Implement
the Enterprise SATCOM Management and Control Reference Architecture.

Modernizing our DoD SATCOM into a resilient enterprise that supports tactically-relevant enterprise capabilities directly supports the United States Space Force's Vision for Satellite Communications (SATCOM) and begins to implement the concepts of the Department's Digital Modernization Strategy. This ESC-MC Implementation Plan provides guidance through an integrated framework and approach for developing the enterprise SATCOM M&C capability described in the Enterprise SATCOM Management and Control Reference Architecture as part of the overall Integrated SATCOM Environment (ISE). The plan also provides guidance to DoD SATCOM's element M&C providers and capability developers through an initial set of tasks organized by key stakeholders.

DoD Chief Information Officer

ESC-MC Implementation Plan

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Enterprise Satellite Communications Management and Control (ESC-MC) Implementation Plan

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John B. Sherman
Chief Information Officer of the
Department of Defense

8 DEC 2022

Date

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JAMES H. DICKINSON
General, USA
Commander
United States Space Command

24 Aug 2022

Date

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JOHN W. RAYMOND
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Chief of Space Operations

7 Oct 22

Date

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ESC-MC Implementation Plan

1.0 INTRODUCTION

Department of Defense (DoD) enterprise SATCOM management and control (ESC-MC) is critical and paramount to both the DoD's Digital Modernization Strategy and the Chief of Space Operations' (CSO) Vision for Satellite Communications (SATCOM). Key stakeholders and their primary roles include the United States Space Command (USSPACECOM) as the Global SATCOM Operations Manager and operator of the ESC-MC capability, United States Space Force (USSF) as the Force Design architect and capability sponsor for ESC-MC, the DoD Chief Information Officer (DoD CIO) as the lead architect for ESC-MC,[1] and the Defense Information Systems Agency (DISA) as a DoD enterprise service provider and DoD Information Network (DODIN) representative as referenced in DoDI 8420.02, "DoD Satellite Communications." The Department requires extensive coordination across DoD to include key stakeholder Combatant Commands, Services, Agencies, Inter-Agencies and with industry to develop, integrate, and manage DoD ESC-MC activities in alignment with the promulgated ESC-MC Reference Architecture (RA).

1.1 Purpose and Scope

The purpose of the DoD ESC-MC Implementation Plan is to implement the enterprise ESC-MC capability and tenets of the *DoD's Digital Modernization Strategy (DMS),* the Chief of Space Operations' *Vision for Satellite Communications (SATCOM),* and the ESC-MC RA by guiding DoD's C3 modernization activities and DoD Components. Specifically, the Implementation Plan builds upon the Digital Modernization Strategy's goal of modernizing warfighter Command, Control, Communications, and Computer (C4) infrastructure and Systems. This includes goal strategy element #8, "Modernize DoD Satellite Communications Management and Control." It builds upon significant progress already achieved (e.g., DISA's SATCOM Ordering Management and Situational Awareness Tool (SOMSAT), USSF's ESC-MC solution architecture, and USSF's SATCOM ESC-MC capability development activities) and highlights areas for further maturity and formalization. Ultimately, it aims to drive integrated execution toward achieving an <u>enterprise-level</u> capability and the strategic vision:

Implementing enterprise SATCOM M&C will enable DoD SATCOM modernization through its development of and access to core enterprise capabilities; these capabilities will increase the flexibility, agility and resiliency of DoD SATCOM, while leveraging the full use of a hybrid, heterogeneous enterprise that uses the best mix of commercial and military solutions. The desired end-state is the ability to provision the seven core capabilities defined in the ESC-MC RA and an operational landscape of updated processes and procedures to enable the DoD to effectively employ and benefit from these new enterprise capabilities.

The Implementaiton Plan provides an approach and framework identifying "what" remains to be accomplished and an initial set of tasks organized by "who" needs to do them for the following seven core capabilities:
1) Mobility and Continuous Communications
2) ESC Management Common Operating Environment (COE)
3) Enterprise SATCOM Situational Awareness/Common Operational Picture (SA/COP)
4) Automated Resource Allocation
5) Electro-Magnetic Interference (EMI) Mitigation
6) Continuity of Operations (COOP)
7) Element/Enterprise Network Interface

Performance characteristics of the seven core capabilities are further delineated in the Joint Space and Communications Layer (JSCL) Initial Capability Document (ICD) as part of the overall Joint Capabilities

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[1] Enterprise SATCOM Management and Control Reference Architecture (ESC-MC RA) version 1.0, December 5, 2019

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Integration and Development System (JCIDS). Upon approval of the plan, the tasks will be tracked through DoD CIO's SATCOM Systems Engineering Group (SSEG) with a more detailed Plan of Action and Milestones (POA&M). POA&M tasks and elements impacting or potentially influencing National Leadership Command Capability equities will be coordinated with the DoD CIO National Leadership Command Capability Management Office. This POA&M will evolve in response to mission needs, operational requirements, and advancements in technology. These initial set of tasks are expected to be completed by FY32 and further tasks may be created and led by OPRs identified in this plan to fully develop and implement the ESC-MC capability.

The Implementaiton Plan addressesonly DoD systems, policies and procedures. Non-DoD systems are encouraged to address and implement the ESC-MC, to the gratest extent possible.

1.2 Governance

The SATCOM System Engineering Group (SSEG), reporting to the C3 Leadership Board (C3LB), will oversee execution of the DoD ESC-MC Implementation Plan. The C3LB responsibilities include the following:

- Providing status to senior-level decision bodies that include the C3LB and the Digital Modernization Infrastructure Executive Committee (DMI EXCOM), and the National Leadership Command Capability Executive Management Board (for National Leadership Command Capability equities).
- Establishing the ESC-MC Technical Working Group (TWG) as the standing body to manage and maintain the POA&M, to track progress and the holistic integration of tasks, to track ESC-MC dependencies that span other initiatives, and continuously guide the efforts of Capability Developer Sponsor and Host and DoD Components.
- Coordinating with the Assistant Secretary of Defense (ASD) for Space Policy, ASD for Acquisition and Sustainment (A&S), USSF, USSPACECOM, and all key SATCOM Stakeholders

The responsibilities and authorities assigned in the Implementation Plan shall not be interpreted to affect the delegated responsibilities and authorities of the Space Force or U.S. Space Command; or any other Department of Defense office with space-related responsibilities and authorities.

2.0 APPROACH AND FRAMEWORK

The implementation of ESC-MC – as described in the ESC-MC Reference Architecture - requires three phases:

- Establish the initial standards and governance.
- Achieve the necessary and foundational services, data and network (OSS/BSS) management integration.
- Complete the full instantiation of ESC-MC capabilities.

Achieving the top-level milestones, as shown in Table 1 and associated with these phases, so that the core ESC-MC enterprise capabilities can be leveraged by the Department in the near future, require complementary technical/architectural, business, operational and planning activities across the Department; activities that will prepare and shape the current DoD SATCOM management design and process for impending innovations. The ESC-MC Reference Architecture identifies a series of capability upgrades (CU 1-6) to be used to implement ESC-MC and transition to enterprise SATCOM operations. Those capability upgrades are referenced in Table 1 and explained further in this plan at Table 3.

Phase/Activities	Phase 1 – Establish ESC-MC Governance and Standards	Phase 2 – Services, Data and Network Management Integration	Phase 3 – ESC-MC Completion

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Milestones	• Publish ESC-MC Implementation Plan • Establish and sustain ESC-MC network and terminal interface standards (user edge to network and between M&C elements) • Formalize ESC-MC governance and business rules	• Design integrated data management scheme • Negotiate standard OSS/BSS information exchange agreements with mission partners • Generate ESC-MC COP • Combine resource allocation requests ((SAR, GAR, GMR, PMR, and GAIT, and ADNS requests) into a consolidated SATCOM **N**etwork **A**ccess **P**rocess **(SNAP)**	• Activate ESC-MC enterprise/element Interface • Automate resource allocation rules/policies • SNAP initialization • Cross boundary OSS/BSS Initiation • Incremental adoption of ESC-MC usage
Technical Actions	• CU 1 – Design COE and CDES and create authoritative data catalogues • CU 2 – Identify authoritative data catalogues	• CU 2 – Create an integrated data management structure and process flows and implement CDES • CU 3 – Initiate hybrid, heterogeneous network information exchange across different security domains leveraging the CDES • CU 4 – test net layer interface, COE, integrated data storage management, IdAM, CDES, NAC, NEM	• CU 4 – Implement net layer interface, COE, integrated data storage and Validate CDES implementation management, IdAM, CDES, NAC, NEM • CU 5 – Implement authoritative data catalogues and data mgt functionality • CU 6 – Implement and test remaining ESC-MC services
Planning and Execution	• Conduct analysis of DoD and SATCOM and network-based policies (for ESC-MC implementation)	• Update DoD SATCOM-based policies (for ESC-MC implementation)	• Implement new DoD SATCOM processes and procedures (for ESC-MC implementation)

Table 1: ESC-MC Implementation Phases

The following sections articulate an approach and framework to facilitate ESC-MC implementation.

2.1 Approach

The enterprise, end-to-end approach used by the SSEG and the C3LB to implement and oversee ESC-MC integrates disparate ESC-MC activities toward a common vision and set of objectives. The approach provides scope and direction for ESC-MC initiatives, uses the Chief of Space Operations' Vision for SATCOM and Digital Modernization Strategy to generate more detailed solution architectures and engineering guidance, and leverages directives and policy to drive DoD Component-level execution. The approach advocates for centralized situational awareness at the top "enterprise" level and decentralized execution at the "element" level. Element M&C includes the resources used to manage and control Military SATCOM, Commercial SATCOM, International Partner (IP) SATCOM and SATCOM ground infrastructure and the DODIN. Each of these levels will rely on various tools such as SOMSAT and a SATCOM Terminal Registry as well as others as they are developed. The approach recognizes legacy capabilities will remain in some cases but must be integrated into the overall ESC-MC capability. Table 2 articulates the enterprise approach in more detail.

#	Step	Description
1	*Focus ESC-MC Initiatives*	• Identify initial set of tasks that provide scope and direction for the development and/or evolution of ESC-MC implementation activities • Establish measurable performance metrics for implementation tasks and track progress using advanced analytics (ADVANA) • Use the SSEG/C3LB to track progress against the initial task list, to manage and update the task list as implementation matures, and to continuously engage leadership for maintained oversite and support
2	*Leverage SATCOM and DoD Digital Modernization*	• Deliver consistent, standardized enterprise IT architectures – supporting faster fielding of new capabilities, interoperability, usability, and improved cybersecurity risk exposure • Converge component network infrastructure – reducing complexity and cost • Eliminate fielding of unnecessary capabilities and services – reducing program overhead
3	*Issue Directives to Drive Execution*	• Mandate implementation or adoption of ESC-MC capabilities by DoD Components through the issuance of policy or task/execute orders • Monitor progress and enforce compliance through the tracking of metrics (ADVANA)

Table 2: Enterprise Approach for Implementing ESC-MC

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2.2 Framework

The framework in Figure 1 organizes ESC-MC capabilities under three imperatives identified in the ESC-MC Reference Architecture's Figure 5.

> **Imperative 1:** Integrating data management,
>
> **Imperative 2:** Automating resource allocation, and
>
> **Imperative 3:** Fusing situational awareness.

These imperatives, in turn, have a foundation in Principles which are described by the ESC-MC RA: the *RA Principles*. These relationships are described in the sub-paragraphs below.

The implementation activities identified in this Plan will result in targeted ESC-MC outcomes as defined broadly by the Chief of Space Operations Vision for SATCOM and more narrowly, in the DoD Digital Modernization Strategy and JSCL ICD.

Targeted ESC-MC outcomes include:

- The ability for the SATCOM enterprise to deliver effects through specific situations and adversary capabilities, which the U.S. military may encounter while executing operations.
- Improved situational awareness, providing the ability to monitor execution of the plan through integrated data visualization and mission management, produced from a consistent set of data making up the SATCOM SA/COP.
- A more rapid and responsive set of warfighter customer services.

Figure 1 Framework

The improved management and control outcomes targeted for the customer services include:

- Reduced initial provisioning process from months to days or hours.
- The ability for Operations Management to preemptively and rapidly recover warfighter communications from service disruptions and anomalies.
- Fulfillment of warfighting customer needs to restore degraded, failed or attacked communications services, based on established Primary, Alternative, Contingency and Emergency (PACE) communications plans.
- The adoption of enterprise repositories, services and data analysis tools for element management customers.
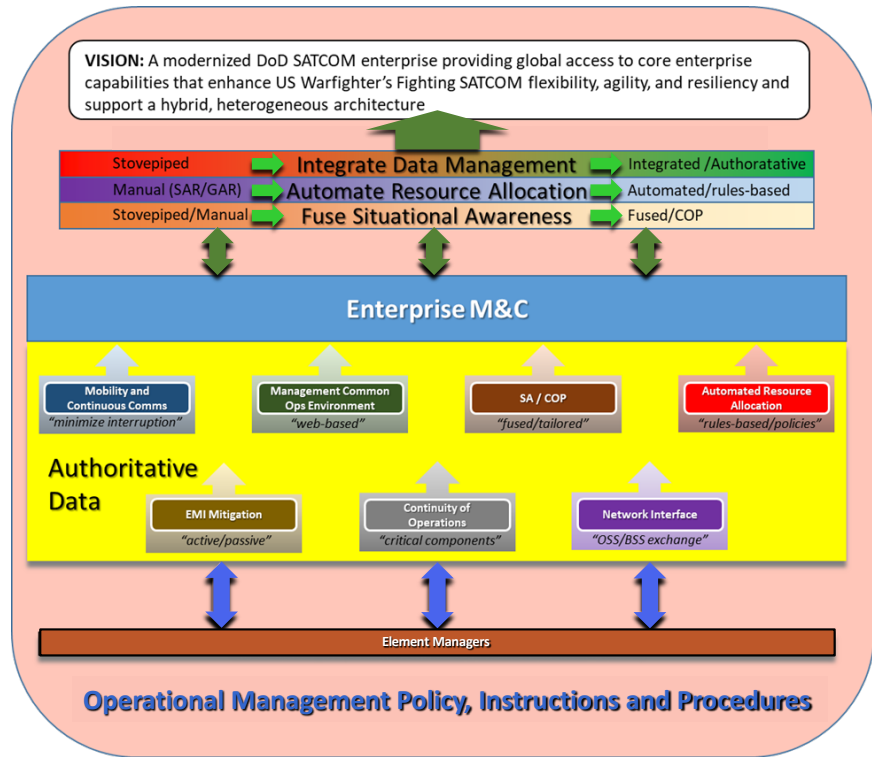
USSF, USSPACECOM, and DISA will, in coordination, maintain these services while managing/resolving disruptions and anomalies, to include capability at the tactical edge in a communications denied environment. The tasks identified in this guidance and any future tasks should fall within the framework.

2.2.1 Integrating Data Management

Integrating data management ensures that authoritative data catalogues are established and used for key functions supporting the ESC-MC. DoD will eliminate data "stove-pipes" through a more centralized and integrated approach for data management that minimizes data error and/or duplication. ESC-MC systems will utilize the Unified Data Library (UDL) for mission and system connections to the greatest extent leveraging DISA's hosting services.

Authoritative Data Sources

RA Principle: Integrate data management and storage using data catalogues for key functions supporting ESC-MC (Authoritative Data - AD).

ESC-MC must develop and use AD sources to minimize duplication and errors in vital processes to include user terminal cataloguing and registration, enterprise-wide service scheduling, resource allocation, requirements management, network planning and modeling. A lack of an AD source for user terminal characteristics and associated registration prevents efficient and effective tracking of DoD terminals and their usage by increasing risk of user terminal configuration errors or conflicted/duplicate entries. A single, authoritative service-scheduling catalogue is needed for the use and reuse of enterprise IT services supporting DoD enterprise SATCOM. AD from terminals, gateways, and the space segment will facilitate ESC-MC situational awareness (SA) and automated resource allocation based on that SA. A common, authoritative source of current and future requirements information prevents duplication of requirements across organizations and reduces errors in resource planning. It also enables the efficient modeling of requirements-based network and architectural planning. SA/COP filtered reports must be queried from the same set of AD to deliver true, shared situational awareness.

Strategic Outcomes:
- Service scheduling, task sequencing, resource allocation, end-to-end (E2E) SATCOM equipment configuration, and SA/COP data are integrated, consistent, available, and reliable through the use of trusted, secure, AD sources.
- Data catalogues are established for critical DoD SATCOM functions identified in the ESC-MC RA.
- SATCOM AD Sources are available as appropriate for other Department and Service capabilities.

IT Service Hosting

RA Principle: Align ESC-MC with DoD cloud computing initiatives and Core Data Centers (CDC) to improve COOP/operations/cybersecurity resiliency.

DoD CDC and DoD cloud providers are the preferred service provider for IT services supporting ESC-MC. ESC-MC solutions must include automated and planned COOP measures, and CDCs support technologies required for backup, COOP, disaster recovery, cross domain, and archival services.

Strategic Outcome:
- Improve the operational effectiveness, efficiency, resiliency and security posture of enterprise and element M&C through DoD cloud computing and use of CDCs.

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Access Control and Management
RA Principle: Provide secure, available access based on approved roles and responsibilities.

ESC-MC will provide a management common operational environment (MGT COE) that supports role-based access to its enterprise capabilities and management functions in a Cross Domain Enterprise Services (CDES) environment. MGT COE will leverage DoD's Identity Access Management (IdAM) RA and Zero Trust RA as well as National Institute of Standards and Technology (NIST) Risk Management Framework (RMF) access control best practices as outlined in NIST SP 800-63-3, Digital Identity Guidelines (June 2017) and NIST SP 800-207, Zero Trust Architecture (August 2020). It must also support mission partner (e.g., Commercial Providers, other Executive Branch agencies, and IP/Allies) federated networks and service/applications while employing CDES as coordinated with/through the DoD's Unified Cross Domain Management Office (UCDMO).

Strategic Outcomes:
- Role-based access to the ESC-MC is readily available while maintaining cybersecurity.
- CDES / Mission Partner access capabilities are supported.

Data Sharing and Information Exchange
RA Principle: Use DoD-selected open standard and communications protocols for data / information exchange based on best business practices.

The modernized Integrated SATCOM Enterprise (ISE) transforms the current stove-piped designs to hybrid, heterogeneous networks involving multiple DoD and non-DoD mission partners. ESC-MC will support the exchange of negotiated network and resource management information via common, open network layer standard interfaces using the Modular Open Systems Approach (MOSA) as detailed in Under Secretary of Defense for Research and Engineering (USD (R&E))'s "Modular Open Systems Approach (MOSA) Reference Frameworks in Defense Acquisition Programs" guide. MOSA enabling standard interfaces may be understood as widely accepted, supported and consensus-based standards set by recognized standards organizations or by the marketplace. ESC-MC Network layer interfaces must provide the appropriate definitions to facilitate the use of a standardized data lexicon and format and include operational and business support system (OSS/BSS) functionally. Common operating environments and a lexicon do not currently exist and will need to be developed to meet the intent of ESC-MC RA and future SATCOM Terminal and Ground Infrastructure Reference Architectures. DoD enterprise SATCOM M&C capabilities that directly communicate with M&C systems of external SATCOM service providers (e.g. commercial, IP) must support vendor and International Partner (IP) extension areas (VEAs/IPEAs) to appropriately protect service provider's proprietary data from inappropriate disclosure.

Strategic Outcomes:
- Bridges hybrid, heterogeneous networking environments for resilient SATCOM service.
- Exchanges agreed upon network management data with element M&C components.
- Supports information and service scheduling and access based on roles and responsibilities.

2.2.2 Automating Resource Allocation

One of the central tenets of the Chief of Space Operations' SATCOM Vision, described as "Fighting SATCOM", are Command and Control (C2) Management processes and systems that support agile planning, operations, and restoral to meet users' tactically-relevant timelines across MILSATCOM, COMSATCOM, IP SATCOM, SATCOM ground infrastructure, and non-SATCOM DODIN infrastructure capabilities. This system must be able to "quickly respond to users' [satellite/ground] access requests" and also "dynamically re-plan and reallocate [DoD] SATCOM resources." These functions are key tenets of

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ESC-MC and an initial instantiation of a dynamically re-allocatable, priority-based M&C capability can be found in the Mobile User Objective System's (MUOS) wideband code division multiple access (wcdma) payload. The system also requires the implementation of decision support technologies like business and operational analytics to include knowing available capacities of SATCOM capabilities, machine learning, and artificial intelligence to predict and provide decision making data points for the rapid allocation or re-allocation of DoD SATCOM resources. As ESC-MC pursues technical solutions to the rapid allocation/re-allocation challenge, operational management policies, processes and procedures must likewise be transformed to make use of these more automated tools. Technical solutions should also include modernization of legacy element planning systems, adoption of existing commercial SATCOM planning tools used by resellers, and maximize direct DoD access to service provider tools needed to plan and allocate purchased COMSATCOM.

Satellite and Gateway Resource Allocation Integration to yield SATCOM Network Access Process (SNAP)
RA Principle: Accelerate Resource Allocation timeliness through automated operational management processes.

To achieve the tactically-relevant timelines for DoD SATCOM allocation and restoral described in the CSO's Vision, all separate satellite and enterprise SATCOM network access request processes must be integrated into a single process. SNAP will leverage the ESC-MC's MGT COE and authoritative data catalogues to reduce the resource allocation timelines to support tiered timelines of user requirements. SNAP will also leverage CDES and Mission Partner Environment (MPE) rules- based processing to ensure DoD information is visible, accessible, understandable, linked, trustworthy, interoperable, secure, and made available to appropriate IPs, to the maximum extent allowed by law, National Archives and Records Administration requirements, National Security Policies, National Disclosure Policies, General Security of Military Information Agreements, or DoD policy as described in DoDI 8110.01 "Mission Partner Environment Information Sharing Capability Implementation for the DoD". SNAP should build on work accomplished in the SATCOM Ordering Management and Situational Awareness Tool (SOMSAT) and must address whether man-in the loop authorities for access authorization remain necessary.

Strategic Outcomes:
- Configure equipment for service and network flexibility within tactically relevant timelines.
- Create single DoD SATCOM access request/authorization process.
- Eliminate manually-intensive processes and likelihood of human error.

Rules-based Policy implementation
RA Principle: Retain timely, local management control through the implementation of policy-based operational management.

To use these new automated processes and promote centralized management and decentralized control, rule-based policies must be predefined for resource requests by local operational managers. These rule-based policies will be used by ESC-MC to support automated rule-based policy implementation. Finally, this automated, rule-based approach employed by ESC-MC must include a range of implementations including orchestration activities, local control, remote operations or autonomous configurations for designated operational managers. Local control must be able to be asserted by the local terminal system operator even when remote policy-based operational management systems are offline or otherwise unable to authenticate or apply policies to the local terminal operator. Additionally, COMSATCOM rules must consider the terms of use imposed by the agreements with commercial service providers. This approach augments or replaces manually-intensive processes currently in use.

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Strategic Outcome:
- Automated, rules-based resource allocation for specific operational scenarios or conditions.
- Optimized flexibility and control, allowing local command override while enabling automated management for other users.
- Enabled users at all echelons with ability to manage rules in their missions, identifying local and global impacts of changes.
- Ability to achieve resource allocation/re-allocation timeliness specified by the JCSL-ICD and Fighting SATCOM operational vision (tiers).

2.2.3 Fusing Situational Awareness

SATCOM SA/COP is data centric, user defined and user accessed based on role at all levels. There is no single SA/COP that can serve as a "one size fits all" product for the DoD SATCOM community of users. Situational awareness is derived from various operational needs and technical requirements; available situation awareness data must then be integrated--consistently and reliably through the use of trusted, authoritative, and accessible data sources--and the resulting information displayed to users at all levels on role-based visualization tools to meet warfighting needs. This approach includes data normalization and decentralized processing to provide data effects without creating monolithic targets to deny the use of these data sources.

Authoritative Data Sources
RA Principle: ESC-MC must develop and use authoritative data sources to support building and maintaining, and querying information from a SA/COP repository.

ESC-MC aim of true-shared situational awareness, must leverage analytics to present DoD SATCOM users with relevant, quality, timely, and actionable information from authoritative data sources. A key to the ESC-MC's ability to provide DoD SATCOM users with tailorable access to SA information is the clear definition of SA requirements of enterprise and element managers and user roles. Based on the enterprise capability objectives collected and coordinated across the community in 2018 and on the JSCL-ICD, the CJCS must formalize and capture an initial set of SA requirements for inclusion in the ESC-MC integrated management environment. The ESC-MC must provide queried access to this information and offer a role-based user the ability to tailor that information into a visualization suite with the necessary advanced analytics and modeling tools needed to achieve the desired warfighting effects.

Strategic Outcome:
- SA requirements are identified and coordinated across the DoD SATCOM stakeholders.
- SA data is integrated, consistent and reliable through sourcing and use of trusted, authoritative data sources.
- ESC-MC supports advanced analytics and modeling of SA data to provide users a "tailored" COP.
- SA enables resiliency through/across the various systems of the integrated SATCOM enterprise.

2.3 High-level End-to-End (E2E) Architecture

Figure 2 below shows, at a high-level, the integrated E2E ESC-MC solution and all of the pertinent elements to support the DoD's ESC-MC vision, the details of which will be defined by the operational synchronization tasks for which USSPACECOM has been assigned lead:
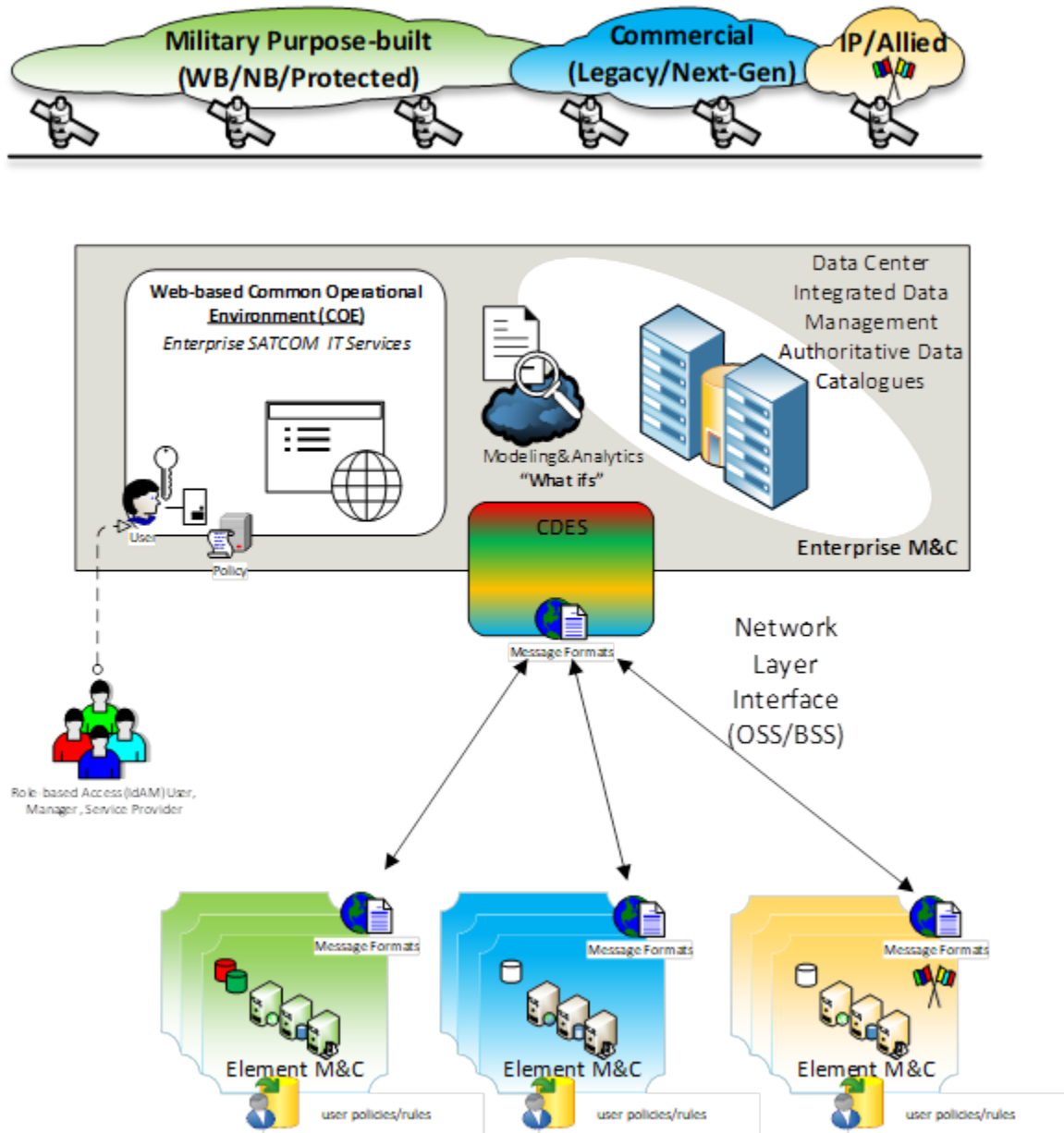
Figure 2: High-level End-to-End ESC-MC Solution

The top-level space segment in figure 2 recognizes that the ESC-MC will be employed to span a hybrid and heterogeneous architecture; this architecture integrates commercial, military and IP satellites /coalition satellites in multiple orbits (geosynchronous and non-geosynchronous).

The grey rectangle at center depicts the CDC/Cloud ecosystem that will be used to host the ESC-MC "enterprise-level" solution. The COE includes necessary cybersecurity and operational considerations to ensure assured access control and autonomy where needed. USSF will use DISA enterprise services to host capabilities consistent with the intent to employ role-based, secure access and cross-domain

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enterprise services to connect multiple commercial and international element networks. SATCOM tools in support of the ESC-MC will identify roles for specific actions and use DISA's identity and access management to execute role-based processes. Cross-domain enterprise services (CDES) hosed by DISA will deliver the interconnectivity between various levels of classification. CDES approval Certification and Accreditation will be performed in accordance with DoD Instruction (DODI) 8540.01. USSF will also incorporate principles of the Cybersecurity Reference Architecture (CSRA).

The double-sided arrows connecting the enterprise and element M&Cs (through the CDES) represent the exchange of negotiated OSS/BSS information. This M&C network layer – also one of the core, seven enterprise capabilities identified by the RA – must be an open interface or set of standards specified by DoD.

Finally, the multi-colored shapes on the bottom level are the various military, commercial, and internationally-partnered element M&C networks that will leverage the catalogues and scheduled services and capabilities offered by the ESC-MC, provide status on DoD users on their services, and support initiation/restoral activities. Other element M&C networks such as enterprise SATCOM gateway services and non-SATCOM DODIN Infrastructure (not depicted) can be added to ensure all elements of enterprise SATCOM are included.

The ESC-MC capability developer/sponsor, as part of the solution architecture will define the common data dictionaries and management interface base and protocol standards to be used to handle the various message and protocol formats.

2.4 Dependencies

The success of ESC-MC relies on other initiatives not addressed in this document. The following are examples (not all inclusive) of potential dependency areas that must be considered in execution.

- Integrated SATCOM Enterprise (ISE): Based upon of the CSO's Vision, this single, integrated SATCOM enterprise will enhance integration between the military and private sectors, with a goal to enable warfighters with the ability to transition between their networks and terminals to alternate resources with little or no disruption. Key elements of the vision are based on digitally engineered enterprise acquisition and provisioning on tactically relevant timelines and include: Global SA/COP, C2 Management System, transport and edge networks, SATCOM terminals, SATCOM governance, and Acquisition & Provisioning. When undergoing legacy terminal system lifecycle tech refresh, upgrades, or replacement, existing SATCOM elements will consider techniques for legacy system transition to facilitate ESC-MC regardless of the maturation of ESC-MC architectures.

- Enterprise Interfaces: When individual SATCOM service provider systems are undergoing tech refresh, upgrades, or replacement, the service provider will consider how to comply with updated ES-MC compliant interfaces. Adjacent enterprises (e.g. Joint Information Environment (JIE), Joint Electro-Magnetic Spectrum Operations (JEMSO), Command, Control, Battle Management and Communications (C2BMC) and Global Command and Control Systems (GCCS)) must enable connectivity to rapidly synchronize effects across all domains and mission areas.

- Policies and Instructions: ESC-MC focuses mainly on the business/technical solutions necessary to provide enterprise access to the core capabilities defined in the ESC-MC RA. However, the operational policies and procedures that govern the operational management activities must be reviewed and updated by their sponsors to employ these modernized capabilities.

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- Continuous Monitoring Capabilities and User Access Management (UAM): DoD IdAM strengthens continuous monitoring and user access management capabilities by improving the trust level of IdAM data associated with authentication and authorization.
- MPE: provides the flexibility and agility to provide cross-domain enterprise services as needed to span multiple commercial, government, and international mission partners.
- JCIDS, Planning, Programming, Budgeting, and Execution System (PPBES) and Presidential Budget Request (PBR) Processes: successful implementation and execution of the ESC-MC capabilities discussed in this document depend heavily on the successful completion of these processes to define and validate requirements, to plan and program funding and staffing resources and to provide appropriate oversight. It is acknowledged that there are organizations that do not strictly follow the JCIDS process such as the National Reconnaissance Office (NRO) and Missile Defense Agency (MDA) and any participation of these organizations in the ESC-MC capability will remain dependent on their acquisition processes.
- Vendor Extension Areas (VEAs). To gain actionable insight into commercial SATCOM provider systems, while protecting the proprietary and competitive interests of the industry providers, the DoD will establish Vendor Extension Areas in the ESC-MC Common Operating Environment. Establishment of the VEAs will depend upon mutually responsive input and dialogue with the industry community, and upon guidance from DoD acquisition and contracting authorities. The DoD must determine the minimum level of vendor information necessary to populate the VEAs. The DoD must publicize all expectations upon providers through formal acquisition and contracting channels. The DoD must establish a distinct method to designate vendor-sensitive information in the ESC-MC COE, and must assign the associated permissions and restrictions for dissemination and use. The DoD must establish and enforce internal safeguards against improper dissemination of vendor-sensitive information.
- International Partner Extension Areas (IPEAs). Similar to the VEAs described above, IPEAs will serve to provide the minimum levels of SA (as agreed to between the U.S. and IPs) to incorporate IP SATCOM capabilities into the overall ISE. The creation of IPEAs will adhere to all cybersecurity requirements protecting both US and IP systems.
- Service Extension Areas (SEAs). Similar to the VEAs and IPEAs described above, SEAs will serve to provide the minimum levels of SA (as agreed to between the USSPACECOM. and the Service) to incorporate Service-specific non-Joint SATCOM capabilities into the overall ISE. The creation of SEAs will adhere to all cybersecurity requirements protecting both Joint and C/S/A-specific systems.

An overview of the Implementation tasks within the larger framework established by the ESC-MC RA is depicted in Figure 3.

3.0 TASKS

The tasks identified in this plan at Appendix 1 are the key activities needed to implement the concepts of the *DoD ESC-MC RA*. They build upon progress already achieved and highlight areas requiring further maturity. All tasks will be characterized in terms of Cost, Schedule and Performance. Cost estimates will be provided by appropriate OPRs and be reissued in the DoD CPG. Schedule estimates are fluid and will be updated to reflect the fiscal climate as it changes. Upon approval of this plan, the C3LB through the SSEG will track and manage progress against this list.

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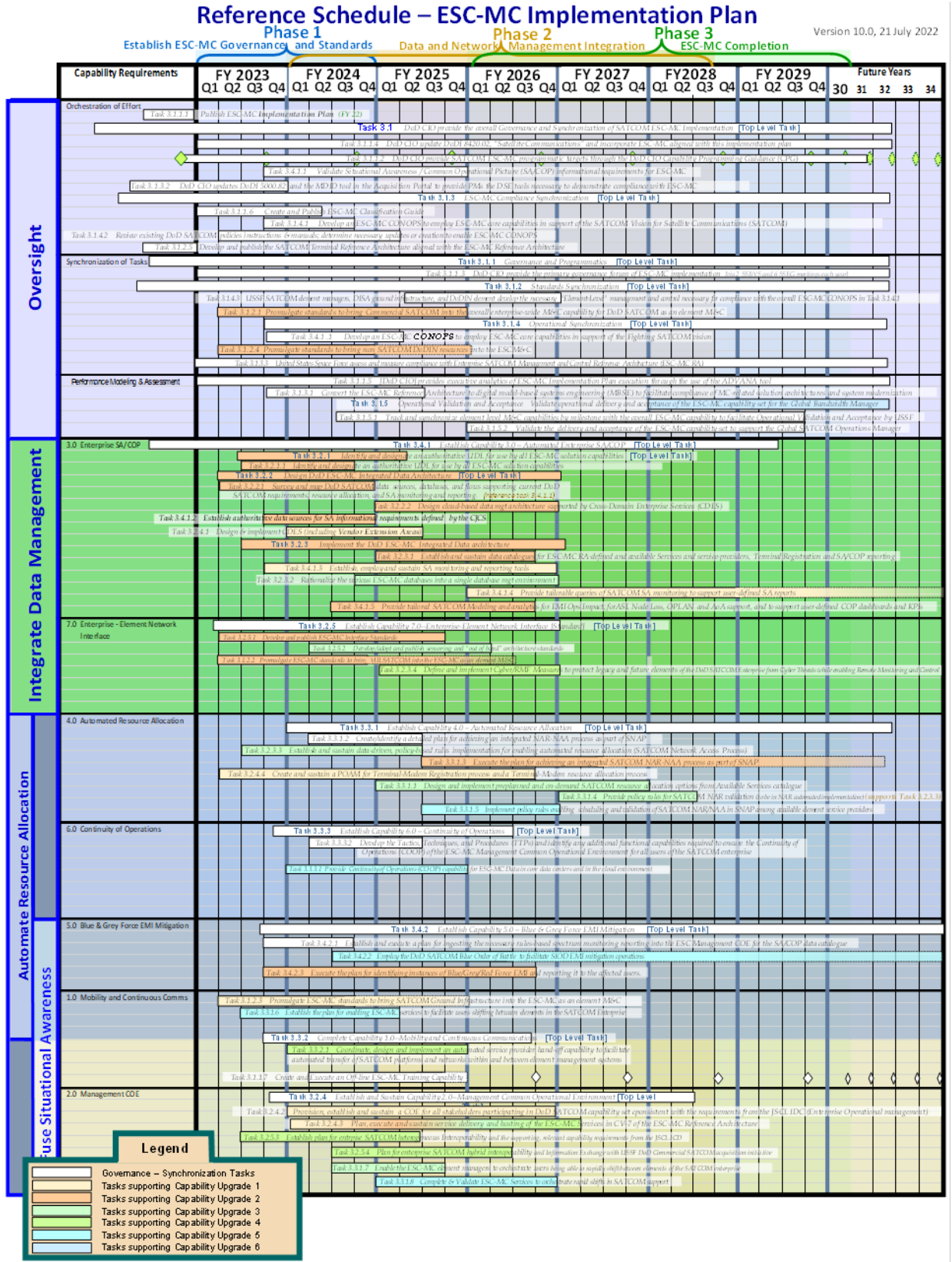
Figure 3 ESC-MC Implementation Plan Schedule

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The Implementation Tasks are shown in Figure 3 by applying the four organizing constructs described within the ESC-MC Reference Architecture as shown in Figure 4 and discussed in the sub-paragraphs below. Figure 3 is shown for illustrative purposes only and is best viewed at:

https://intelshare.intelink.gov/sites/c3i/Team21/ESC-MC%20Implementation%20Plan/ESC-MC%20I-Plan%20AO-Level%20Coordination%20Documents

Individual tasks are described in detail in Appendix 1 of this Implementation Plan.
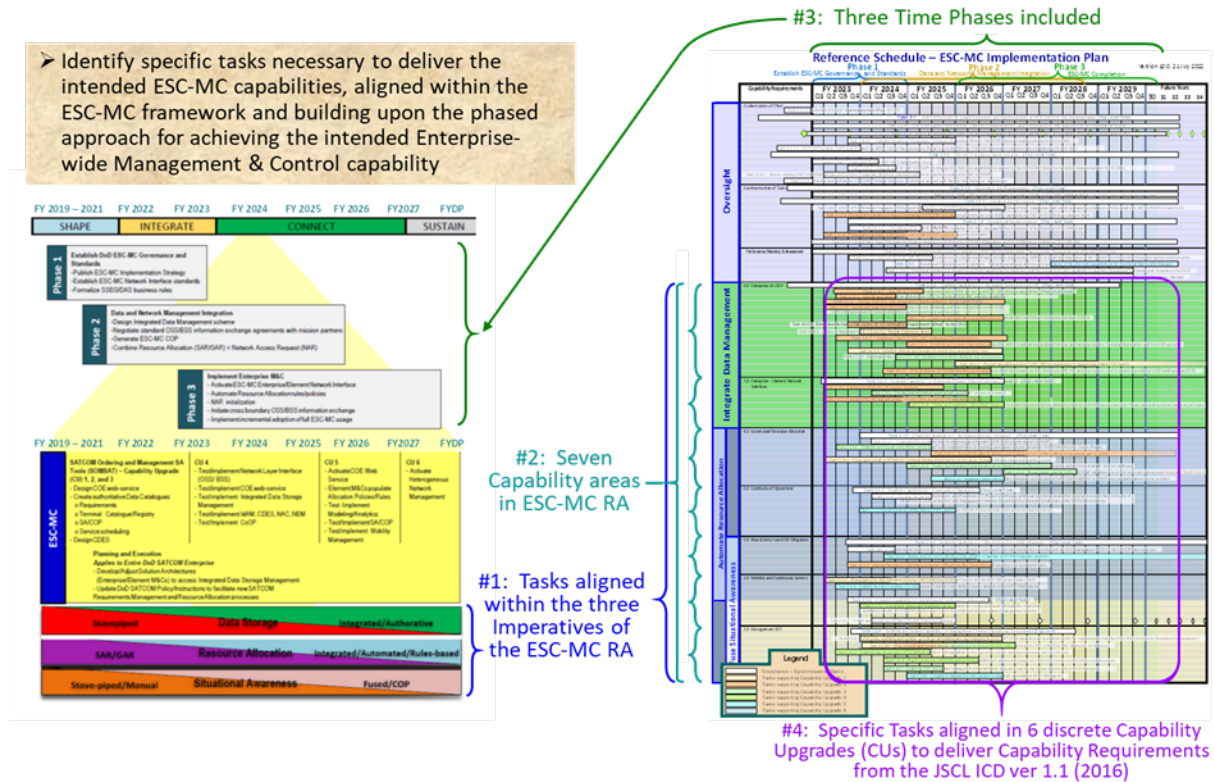
Figure 4 Mapping ESC-MC Reference Architecture Organizing Constructs to the Implementation Tasks

- The first construct is based on the three phases of Implementation defined in the ESC-MC Reference Architecture and summarized in Table 1 of this Implementation Plan:

  - **Phase 1**: Establish DoD ESC-MC Governance and Standards [FY 23 - FY 24]
  - **Phase 2**: Data and ESC-MC Network Management Integration [FY 24 - FY 28]
  - **Phase 3**: Implement enterprise SATCOM Management & Control [FY 26 - FY30]

- The second construct applies the three Imperatives of Implementation indicated in the ESC-MC Reference Architecture:

  - **Imperative 1**: Integrate Data Management
  - **Imperative 2**: Automate Resource Allocation
  - **Imperative 3**: Fuse Situational Awareness

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- The third construct maps the tasks to the seven Capabilities defined within the 2016 Version 1.1 of the JSCL ICD:

  – **Capability 1.0**: Mobility and Continuous Communications
  – **Capability 2.0**: Management COE
  – **Capability 3.0**: Enterprise SATCOM SA/COP
  – **Capability 4.0**: Automated Resources Allocation
  – **Capability 5.0**: Blue & Grey Force EMI Mitigation
  – **Capability 6.0**: COOP
  – **Capability 7.0**: Enterprise - Element Network [Management] Interface

- The fourth construct identified in the ESC-MC Reference Architecture is the grouping of aspects of specific functions into Capability Upgrades. There are six Capability Upgrades (CU) identified in the ESC-MC RA which are introduced in Table 1 of this Implementation Plan. They are further explained below.

Capability Upgrade Number	Short Form Name	Description in the ESC-MC Reference Architecture

1	COE (Web-based where appropriate)	• Design and implement the functionality (basis for Management COE)
		• Create authoritative Data Catalogs
		  – Requirements
		  – Terminal Catalogue
		  – Service Provider Catalogue
		  – Network Provider Catalogue
		  – SA/COP
		  – Service Scheduling
		  – Threats
		• Design CDES

2	Data Management and CDES	• Create an integrated data management structure, process flows, *and* establishing required authoritative data catalogues supporting SATCOM requirements management and modeling, terminal catalogue/registry, SA/COP reporting, threats, and enterprise IT service scheduling • Implement the CDES
3	Reduced Service Request Lead-time	• Initiate hybrid, heterogeneous network information exchange across different security domains leveraging the CDES • Field more rapid & responsive SATCOM service scheduling capability supporting tactically responsive timelines • Modernize legacy DoD planning systems
4	Test & Implement Core Enabling Services	• Test and implement

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Capability Upgrade Number	Short Form Name	Description in the ESC-MC Reference Architecture
		– The network layer or standard MIB interface (Operations Support System & Business Support System) – Test and implement COE web-service – Test and implement Integrated Data Storage Management – Test and implement IdAM, SATCOM Network Access Control (NAC) & Network Element Management (NEM) – Test and implement COOP • Validate CDES implementation
5	Validate Core Enabling Capabilities	Test and implement the integrated data management functionality; additionally • Activate COE • Element M&Cs populate Allocation Policies/Rules • Test/implement Modeling/Analytics • Test/implement SA/COP • Test/implement Mobility Management
6	Initiate enterprise Management of Heterogeneous Network	• Test and implement the Web-based Management COE, and the remaining associated services and policies to implement the ESC-MC core capabilities • Activate Heterogeneous Network Management

Table 3: ESC-MC Capability Upgrades

The Capability Upgrades of which each task is a part are identified in the discussion of each Implementation Task; they are reflected in Figure 3 by one of seven colors shown for each task: white for governance and synchronization tasks; six colors, one for each capability upgrade.

The Implementation Tasks are presented in detail in Appendix 1 of this ESC-MC Implementation Plan; they are organized using the framework illustrated in Figure 3. Specifically, the tasks are identified as being associated with the overall governance and synchronization of the ESC-MC Implementation Plan or as being associated with one of the Three Imperatives for achieving a mature, effective ESC-MC capability for the Department.

The Office of Primary Responsibility (OPR) for each Implementation Task is responsible for the following:

- Completion of a business case analysis as appropriate
- Development of a POA&M that identifies milestones, dependencies, and risks
- Leveraging of existing capabilities or solutions upon which to evolve when appropriate
- Complying with DoD-approved solution architectures and engineering designs
- Reporting of status as required
- Escalation of issues
- Completion of the task in alignment with approved guidance and with support from Office(s) of Collateral Responsibility (OCRs).

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4.0 CONCLUSION

The DoD ESC-MC Implementation Plan provides the framework and guidance for driving coordinated implementation of the DoD ESC-MC Reference Architecture by identifying the key tasks needed to implement the *DoD ESC-MC RA*.   The ESC-MC Implementation Plan is built upon existing initiatives and current progress. Upon approval of this plan, OPRs and OCRs will take the steps necessary to begin implementation of their tasks. DoD CIO will proceed under the authority derived from the CIO's responsibility as the Principal Staff Assistant for IT to include Communications. USSPACECOM will proceed under the authorities provided under the Unified Command Plan as the Global SATCOM Operations Manager. USSF and other Services will proceed within their doctrinal responsibilities to organize, train, and equip forces for presentation to combatant commands. The DoD CIO, through the ESC-MC TWG, will track and manage progress against the tasks and will evolve the Implementation Plan as progress, opportunities and circumstances warrant, with input from the designated OPRs and OCRs. This Implementation Plan establishes the foundation for establishing ESC-MC for the DoD SATCOM community and fielding those capabilities in a phased manner to begin the incremental improvement of the management of SATCOM at the soonest practicable time.

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APPENDIX A: Enumeration of ESC-MC Implementation Tasks

3.1 Governance and Synchronization

3.1.1 Governance and Programmatics

3.1.1.1 Publish ESC-MC Implementation Plan

OPR: DoD CIO   OCR: USSF, USSPACECOM

Capability Area: N/A

Capability Upgrade: N/A

References: DoDI 8420.02

Description: The Department of Defense Chief Information Officer Deputy CIO for Command, Control, and Communications (DoD CIO (C3)), United States Space Force (USSF) Space Operations Command Director of Plans (SpOC S5), and United States Space Command Director of Global Operations and Joint Space Operations Development Directorate (USSPACECOM J3) will sign out the ESC-MC Implementation Plan.

Metrics and Performance Indicators:

Cost: N/A

Schedule: FY22; Reviewed Annually

Performance: ESC-MC coordinated with key stakeholders

Metrics: Published and Maintained Implementation Plan

3.1.1.2 DoD CIO provide ESC-MC programmatic targets through the DoD CIO Capability Programming Guidance (CPG)

OPR: DoD CIO   OCR: Services, DISA

Capability Area: N/A

Capability Upgrade: All

References: DoDI 8420.02

Description: DoD CIO will work with the Services and DISA to publish Annual DoD CIO Capability Programming Guidance (CPG) in support of the National Defense Strategy, National Security Strategy, DoD Digital Modernization Strategy, DoD Command, Control

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& Communications (C3) Modernization Strategy and the ESC-MC Implementation Plan to include funding profiles across the Future Year Defense Program for discreet ESC-MC capabilities. The DoD CIO will receive Services' and DISA's budget certification briefs and self-ratings and provide an overall assessment to the DoD CIO of whether budget actions are sufficient to deliver capabilities as outlined/directed in the DoD CIO's CPG. The DoD CIO will consider inputs and provide an overall annual assessment of IT investment necessary to support the National Security Strategy and National Defense Strategy to the Secretary of Defense and to Congress.

Metrics and Performance Indicators:

Cost: N/A

Schedule: Annually

Performance: DoD CIO publish the SATCOM portion of the DoD CIO CPG and specifically discrete ESC-MC tasks. DoD CIO annually review Service/Agency self-reporting and provide assessments on the sufficiency of funding and executing ESC-MC tasks and other supporting tasks.

Metrics: Published DoD CIO CPG and assessments.

3.1.1.3 DoD CIO provide the primary governance forum of ESC-MC implementation
OPR: DoD CIO   OCR: JS J6, USSPACECOM J3, DISA IE, SSEG Stakeholders

Capability Area: N/A

Capability Upgrade: All

References: DoDI 8420.02

Description: The DoD CIO will provide overall governance and oversight of ESC-MC through the execution of the SATCOM Synchronization and Integration Work Shop (SSIWS) and SATCOM Systems Engineering Group (SSEG) with up-channeling of key issues/decisions to the Command, Control, and Communications Leadership Board (C3LB). Issues/decisions impacting or influencing National Leadership Command Capability equities will be up-channeled through the DoD CIO National Leadership Command Capability Management Office to the National Leadership Command Capability Executive Management Board. As part of the governance process, CIO will monitor overall ESC-MC compliance as an aggregate of the defined compliance measures in the various tasks throughout this I-Plan.

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Metrics and Performance Indicators:

Cost: N/A

Schedule: 2 SSIWS and 6 SSEGs per year

Performance: ESC-MC solution providers will work ESC-MC issues through their respective organizations and within the SSIWS and SSEG.

Metrics: ESC-MC actions reviewed annually

3.1.1.4 DoD CIO update DoDI 8420.02, "Satellite Communications" and incorporate ESC-MC aligned with this implementation plan

OPR: DoD CIO   OCR: JS J6, SSEG Stakeholders

Capability Area: N/A

Capability Upgrade: All

References: DoDI 8420.02

Description: ESC-MC is an enduring enterprise capability and does not have a fixed end state due to changing requirements, SATCOM and networking technology, Warfighter CONOPS, and evolving cybersecurity, jamming, and other threats. As such, ESC-MC must support ever-changing mission needs with the full support of each stakeholder. This requires institutionalization of ESC-MC at the policy level. This task focuses on updating roles and responsibilities with the appropriate authorities for implementing and managing ESC-MC.

Metrics and Performance Indicators:

Cost: N/A

Schedule: DoDI 8420.02 is updated every two years with the inclusion of ESC-MC

Performance: Policies, processes, architectures, and standards are implemented that delineate roles and responsibilities of DoD Components and mission owners for ESC-MC.

Metrics: Policies, instructions, processes, architectures and standards prepared, coordinated and published as appropriate to enable the implementation of the ESC-MC Reference Architecture

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3.1.1.5 Provide executive analytics of ESC-MC I-plan execution through the use of the ADVANA tool.

OPR: DoD CIO   OCR: USSF, DISA IE

Capability Area: N/A

Capability Upgrade: All

References: DoDI 8420.02

Description: The Office of the Secretary of Defense (OSD) uses the ADVANA tool to track and audit progress of DoD capabilities. DoD CIO will use ADVANA, where appropriate, to track the progress of ESC-MC tasks and metrics outlined in the ESC-MC Implementation Plan. DoD CIO will make ADVANA dashboards available to all key ESC-MC stakeholders to ensure accuracy and completeness toward achieving the overall ESC-MC capability for the Department.

Metrics and Performance Indicators:

Cost: N/A

Schedule: Quarterly review of ADVANA dashboards starting FY23, Q1

Performance: ADVANA dashboards created for key metrics as described in the ESC-MC Implementation Plan.

Metrics: Dashboards provide indicators for required action to execute against planned costs and schedule.

3.1.1.6 Create and publish an ESC-MC classification guide.

OPR: USSF   OCR: USSPACECOM, DoD CIO, DISA

Capability Area: All

Capability Upgrade: All

References: DoDM 5200.01

Description: The USSF will create an ESC-MC Security Classification Guide to aid in shaping appropriate security measures in the design and implementation of ESC-MC solutions and processes. The ESC-MC Classification Guide should inform how information and data are accessed, stored, and shared.

Metrics and Performance Indicators:

Cost: N/A

Schedule: Available in FY24 Q2 and reviewed annually thereafter

Performance: Published ESC-MC Security Classification Guide

Metrics: N/A

3.1.1.7 Create and execute an off-line ESC-MC training capability.

OPR: USSF   OCR: USSPACECOM, C-SSEs, DISA

Capability Area: All

Capability Upgrade: All

References: Air Force Manual 36-2234

Description: The USSF will create an off-line ESC-MC training capability to ensure all aspects of the ESC-MC capability are known and trainees are able to operate the systems and processes effectively in executing the CSO's Vision for Satellite Communications (SATCOM). USSF will consider using ESC-MC training in SATCOM Operations Training Curriculum for maximum exposure to Space Guardians and others attending formal training. USSF may utilize training from other sources such as DISA and the C-SSEs as part of their overall responsibility.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: Available in FY25 Q4 and reviewed annually thereafter

Performance: ESC-MC Workforce properly trained resulting in achievement of performance metrics listed in each of the I-Plan's tasks

Metrics: TBD by USSF

3.1.2 Standards and Synchronization
3.1.2.1 Promulgate standards to bring Commercial SATCOM into the overall enterprise-wide M&C capability for DoD SATCOM as an element M&C.

OPR: USSF   OCR: DISA, USSPACECOM, Commercial SATCOM
                                 Service Providers

Capability Area: N/A

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Capability Upgrade: CU 2 -- Data Management and Cross Domain Enterprise Services (CDES)

References: DoDI 8420.02

Description: USSF will develop the necessary interface standards to bring Commercial SATCOM capabilities into the overall enterprise-wide M&C capability for DoD SATCOM. DoD SATCOM M&C capabilities that directly communicate with M&C systems of external SATCOM service providers (e.g. commercial, International Partner) must support vendor extension areas (VEAs) to appropriately protect mission partners' proprietary data from inappropriate disclosure. VEAs will provide the DoD with sufficient situational awareness to know the health and availability of the commercial capability for potential use by warfighters. DISA will capture the interfaces and standards necessary for this task in its leadership role of the SATCOM Interoperability and Standards Committee (SISC).

Metrics and Performance Indicators:

Cost: TBD by USSF and included by DoD CIO in the Annual DoD CIO CPG

Schedule: FY23, Q2 through FY25, Q4 then Quarterly review by the SISC

Performance: Commercial SATCOM Service Providers deliver capabilities while enabling the necessary situational awareness to optimize use by DoD warfighters.

Metrics: Percentage of compliant Commercial SATCOM Service Providers and percentage of commercial throughput per/provider as compared to the total number of DoD Commercial SATCOM Service Providers/throughput. Additionally, qualitative (yes/no) assessments of whether the VEAs support Capability Upgrades 1 through 7 as illustrated in Table 3

3.1.2.2   Promulgate ESC-MC standards to bring MILSATCOM into the ESC-MC as an element M&C.

OPR: USSF   OCR: MILSATCOM and SATCOM Ground Infrastructure C-SSEs, USSF SATCOM control system PMs, USSPACECOM, DISA

Capability Area: 7.0

Capability Upgrade: CU 2 -- Data Management and Cross Domain Enterprise Services (CDES)

References: DoDI 8420.02

Description: USSF will work with the MILSATCOM C-SSEs, USSF SATCOM control system PMs, USSPACECOM and DISA's SATCOM Ground Infrastructure C-SSE to develop the necessary interface standards to bring MILSATCOM capabilities into the overall ESC-MC capability. DISA will capture the interfaces and standards necessary for this task in its leadership role of the SATCOM Interoperability and Standards Committee (SISC).

Metrics and Performance Indicators:

Cost: TBD by USSF and C-SSEs and included by DoD CIO in the Annual DoD CIO CPG

Schedule: Start in FY23, Q2 and schedule delivered by USSF and C-SSEs and included by DoD CIO in the Annual DoD CIO CPG.

Performance: MILSATCOM service providers allocate and report on situational awareness to optimize use by DoD warfighters.

Metrics: Percentage of compliant MILSATCOM providers as compared to the total number of DoD MILSATCOM providers.

3.1.2.3 *Promulgate ESC-MC standards to bring SATCOM ground infrastructure into the ESC-MC as an element M&C.*

OPR: DISA   OCR: USSPACECOM, USSF and SATCOM Ground C-SSE

Capability Area: 7.0

Capability Upgrade: CU 2 -- Data Management and Cross Domain Enterprise Services (CDES)

References: DoDI 8420.02

Description: DISA will work with USSPACECOM and USSF to develop the necessary interface standards to bring the DISA SATCOM Ground Infrastructure (including Teleport System) capabilities into the overall ESC-MC capability. DISA will capture the interfaces

and standards necessary for this task in its leadership role of the SATCOM Interoperability and Standards Committee (SISC).

Metrics and Performance Indicators: N/A

Cost: TBD by DISA and included by DoD CIO in the Annual DoD CIO CPG

Schedule: Start in FY23, Q2 with schedule delivered by DISA and included by DoD CIO in the Annual DoD CIO CPG.

Performance: DISA SATCOM Ground Infrastructure service providers allocate and report on situational awareness to optimize use by DoD warfighters.

Metrics: Percentage of SATCOM Ground Infrastructure exchanging information with the SATCOM SA/COP and SATCOM element managers.

3.1.2.4 *Promulgate ESC-MC standards to bring non-SATCOM DODIN resources into the ESC-MC as an element M&C.*

OPR: DISA JFHQ DODIN   OCR: USSPACECOM and USSF

Capability Area: 7.0

Capability Upgrade: CU 2 -- Data Management and Cross Domain Enterprise Services (CDES)

References: DoDI 8420.02

Description: DISA will develop the necessary interface standards and capabilities to bring non SATCOM DODIN resources into the overall ESC-MC capability including IP interface to other commercial and military networks. Non-SATCOM DODIN resources include items such as cyber, spectrum, Command and Control (C2) systems, interfaces to terrestrial long-haul infrastructure and various DISN Services and Applications. DISA will capture the interfaces and standards necessary for this task in its leadership role of the SATCOM Interoperability and Standards Committee (SISC).

Metrics and Performance Indicators:

Cost: TBD by DISA and included by DoD CIO in the Annual DoD CIO CPG

Schedule: Start in FY23, Q2 and schedule delivered by DISA and included by DoD CIO in the Annual DoD CIO CPG.

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Performance: DISA publish interfaces through the SISC and include ESC-MC stakeholders in SISC working groups and deliberations.

Metrics: DISA deliver and provide access to the established interface standards and DISA hosted capabilities

3.1.2.5 *Develop and publish the SATCOM Terminal Reference Architecture aligned with the ESC-MC Reference Architecture*.

OPR: DoD CIO   OCR: DISA, USSPACECOM, USSF, C-SSEs, Commercial SATCOM Service Providers

Capability Area: 1.0 – Mobility and Continuous Communications

Capability Upgrade: CU 1 -- COE

References: DoDI 8420.02

Description: The DoD CIO and DISA will produce a SATCOM Terminal Reference Architecture (TRA) using model-based systems engineering. The SATCOM TRA will identify key standards and interfaces necessary to support the ESC-MC SATCOM terminal registry to facilitate improved resource provisioning, planning, and resource allocation processes. The SATCOM TRA will leverage all SATCOM terminal standards and interfaces as documented and published by the SATCOM Interoperability and Standards Committee (SISC).

Metrics and Performance Indicators:

Cost: TBD

Schedule: Completion by Q4 of fiscal year 2022.

Performance: DoD CIO produce the SATCOM TRA and monitor implementation for expected reduced SATCOM terminal development, certification, and resource allocation times.

Metrics: Delivery of the SATCOM TRA and longer term measurement of reduced times for development, certification, and from initial provisioning request to communications fulfillment based on compliance with SATCOM TRA

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3.1.3   ESC-MC Compliance Synchronization

3.1.3.1   *Convert the ESC-MC RA to digital model-based systems engineering (MBSE) to facilitate compliance of MC-related solution architectures and system modernization*

OPR: DoD CIO   OCR: USSF

Capability Area: N/A

Capability Upgrade: N/A

References: DoDI 8420.02

Description: DoD CIO will convert the ESC-MC RA into a digital architecture using MBSE during the next scheduled update in 2023. Use of MBSE facilitates validation and verification of ESC-MC solutions for compliance with the reference architecture in a timely and complete manner in support of ESC-MC delivery and modernization. MBSE will capture key standards and interfaces and synchronize and align with the other family of ESC-MC reference and solution architectures.

Metrics and Performance Indicators:

Cost: N/A

Schedule: FY23, Q4 through FY 25, Q2

Performance: MBSE facilitates compliance checks with other ESC-MC related architectures and facilitates capability integration and interoperability

Metrics: Issuance of ESC-MC RA using MBSE

3.1.3.2   *Update DoDI 5000.82 "Acquisition of IT" and the Milestone Document ID (MDID) tool in the acquisition portal to provide SATCOM and ESC-MC PMs the Data Services Environment (DSE) tools necessary to demonstrate compliance with ESC-MC*

OPR: DoD CIO   OCR: USD A&S, USD R&E, USSF

Capability Area: N/A

Capability Upgrade: N/A

References: DoDI 5000.82

Description: DoD CIO will work with USD A&S and USD R&E to list the Statutory and Regulatory requirements at each of the milestones and other decision points during acquisition of ESC-MC capabilities and include those information requirements in DoDI

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5000.82's MDID.   ESC-MC acquirers will report on each of these requirements during acquisition milestone reviews

Metrics and Performance Indicators:

Cost: N/A

Schedule: FY22, Q1 through FY23, Q4

Performance: Acquirers of ESC-MC capabilities will report on key information requirements during acquisition milestone reviews.

Metrics: Updated 5000.82 and MDID; Compliance with 5000.82 during ESC-MC acquisition of ESC-MC capabilities

3.1.3.3 *Assess and measure compliance with Enterprise SATCOM Management and Control Reference Architecture (ESC-MC RA)*

OPR: USSF   OCR: DoD CIO, DISA

Capability Area: N/A

Capability Upgrade: All

References: DoDI 8420.02

Description: United States Space Force will assess and measure compliance with the ESC-MC RA. USSF will coordinate with the DoD CIO's SSIWS and SSEG as well as DISA's SISC in the execution of its duties and assist ESC-MC developers with the implementation of MBSE solution architectures

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: Continuous Activity

Performance: USSF provide annual assessment to the SSEG

Metrics: Percentage of ESC-MC RA compliant architectures within SWAC force designs

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3.1.4 Operational Synchronization

3.1.4.1 Develop an ESC-MC CONOPS to employ ESC-MC core capabilities in support of the SATCOM Vision for Satellite Communications (SATCOM)

OPR: USSPACECOM J3   OCR: USSPACECOM J8, Services, DISA, DoD CIO

Capability Area: N/A

Capability Upgrade: N/A

References: Unified Command Plan and USSF Vision for Satellite Communications (SATCOM)

Description: United States Space Command J3 will author and issue a Concept of Operations (CONOPS) for the employment of the ESC-MC as described in the ESC-MC reference architecture and implementation plan. The CONOPS will align with USSPACECOM's roles and responsibilities outlined in the Unified Command Plan (UCP) and support the Chief of Space Operations' Vision for SATCOM.

Metrics and Performance Indicators:

Cost: TBD by USSPACECOM

Schedule: FY23, Q4 through FY24 Q3 with revisions NLT every 2 years.

Performance: Use of ESC-MC capabilities will be in accordance with the ESC-MC CONOPS

Metrics: Published and maintained CONOPS.

3.1.4.2 Review existing DoD SATCOM policies, instructions, and manuals to determine necessary updates or creation to enable ESC-MC CONOPS.

OPR: USSPACECOM   OCR: DoD CIO, Joint Staff, DISA and Services

Capability Area: N/A

Capability Upgrade: N/A

References: N/A

Description: United States Space Command along with the DoD CIO, Joint Staff, DISA and Services will ensure ESC-MC is included in all policies, instructions, and manuals applicable to their authorities as part of periodic revisions and consistent with and enabling the USSPACECOM ESC-MC CONOPS.

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Metrics and Performance Indicators:

Cost: N/A

Schedule: FY23, Q2 through FY25, Q1

Performance: N/A

Metrics: ESC-MC considered in review/update of all policies, instructions, and manuals.

3.1.4.3   USSF MILSATCOM and COMSATCOM element managers and DISA SATCOM ground infrastructure and DODIN element managers develop the necessary "element-level" management and control necessary for compliance with the overall ESC-MC CONOPS in task 3.1.4.1

OPR: USSF   OCR: DISA

Capability Area: N/A

Capability Upgrade: N/A

References: ESC-MC CONOPS (when developed)

Description: United States Space Force MILSATCOM and COMSATCOM element managers and C-SSEs will comply with this I-Plan and the ESC-MC CONOPS issued by United States Space Command (USSPACECOM) as tasked in 3.1.4.1 to facilitate the concept of centralized situational awareness and decentralized execution of resource allocation by the SATCOM System Operators as "element managers." USSF will work with commercial SATCOM service providers to create Vendor Extension Areas (VEAs) for the providers to participate in management and control capabilities for the DoD SATCOM enterprise without compromising proprietary information.   DISA will work with the USSF to bring in the SATCOM Ground Infrastructure and non-SATCOM DODIN elements. DoD CIO will specify the expected programming for element-level management and control in its Capability Programming Guidance as indicated in task 3.1.1.2

Metrics and Performance Indicators:

Cost: TBD

Schedule: FY24 (Q3) through FY26 (Q4)

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Performance: All USSF MILSATCOM element managers fully participating in overall ESC-MC

Metrics: Percentage of element managers that are ESC-MC complaint

3.1.5 Operational Validation and Acceptance

3.1.5.1 Track and synchronize element level M&C capabilities by milestone with the overall ESC-MC capability to facilitate operational validation and acceptance by USSF

OPR: USSF   OCR: USSC, C-SSEs, DISA, DoD CIO

Capability Area: All

Capability Upgrade: CU-6, Implement and Test ESC-MC Services

References: DoDI 8420.02

Description: United States Space Force will synchronize and track element-level management and control capabilities as part of the overall ESC-MC capability. USSF will track major milestones and ensure element-level capabilities are integrated into ESC-MC in a deliberate manner to ensure continued optimal performance of the capability.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY24, Q3 through FY28, Q3

Performance: ESC-MC will perform in accordance with the CONOPS and align with the SATCOM Vision.

Metrics: As established in the Joint Space Capabilities Layer Initial Capabilities Document.

3.1.5.2 Validate the delivery and acceptance of the ESC-MC capability set to support the Global SATCOM Operations Manager

OPR: USSF   OCR: USSPACECOM, DISA

Capability Area: All

Capability Upgrade: CU-6, Implement and Test ESC-MC Services

References: Unified Command Plan

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Description: United States Space Force will validate the ESC-MC capability is performing in accordance with the ESC-MC CONOPS and delivering the intended performance to achieve the roles assigned to USSPACECOM as the Global SATCOM Manager as designated by the Unified Command Plan (UCP).   USSPACECOM will formally accept the ESC-MC capability as operational and available to warfighters in the appropriate Operations Order.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY26, Q1 through FY28, Q3

Performance: ESC-MC will perform in accordance with the CONOPS and help achieve roles assigned by the UCP.

Metrics: As established in the Joint Space Capabilities Layer Initial Capabilities Document.

3.2 Integrated Data Management Imperative

3.2.1 Unified Data Library (UDL)

3.2.1.1 *Identify and designate an authoritative UDL for use by all ESC-MC solution capabilities*
OPR: USSF   OCR: DISA

Capability Area: 2.0 ESC-MC Management Common Operational Environment (COE)

Capability Upgrade: CU-2, Data Management and CDES

References: DoD Data Strategy

Description: United States Space Force will designate an authoritative UDL for use by ESC-MC solution capabilities. The UDL may consist of authoritative but federated data sources based on the mapping in Task 3.2.2.1.   The UDL will comply with guidance issued by the DoD Chief Data Officer. USSF will use DISA, as appropriate, for hosting the UDL as an enterprise service.

Metrics and Performance Indicators:

Cost: TBD by USSF SSC

Schedule: FY23, Q3 through FY24, Q3

Performance: All ESC-MC capabilities draw from and publish to the UDL

Metrics: UDL identified and available; Percentage of ESC-MC capabilities using the UDL

3.2.2 Design DoD ESC-MC Integrated Data Architecture

3.2.2.1 Survey and map DoD SATCOM data sources, databases, and flows supporting current DoD SATCOM requirements, resource allocation, and SA monitoring and reporting (reference task 3.4.1.1.)

OPR: USSF   OCR: DISA, C-SSEs

Capability Area: 2.0 ESC-MC Management Common Operational Environment (COE)

Capability Upgrade: CU-2, Data Management and CDES

References: DoD Data Strategy

Description: United States Space Force will survey and map DoD SATCOM data sources (MILSATCOM, COMSATCOM, IP Shared Infrastructure, SATCOM Ground Infrastructure and non-SATCOM DODIN infrastructure) databases, and data flows supporting current DoD SATCOM requirements, resource allocation, and situational awareness monitoring and reporting. USSF will use the results of the mapping to inform the designation of the UDL. Data architecting includes both internal (within COE) and external interface definitions and maintain these using digital engineering tools/techniques.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY23, Q2 through FY24, Q4

Performance: N/A

Metrics: Data Sources and Flows Identified

3.2.2.2 Design a cloud-based data management architecture supported by Cross-Domain Enterprise Services (CDES).

OPR: DISA   OCR: USSF, C-SSEs and Joint Staff

Capability Area: 2.0 ESC-MC Management Common Operational Environment (COE)

Capability Upgrade: CU-2, Data Management and CDES

ESC-MC Implementation Plan

References: DoDI 8540.01

Description: DISA will design a cloud-based data management architecture supported by CDES to integrate DoD SATCOM management of resource allocation, user requirements, SA monitoring and authoritative data catalogues (terminal registry, requirements, services). DISA will work with USSF to integrate the UDL into the data management architecture and comply with guidance issued by the DoD Chief Data Officer. For CDES, DISA will ensure commercial configurations conduct a threat assessment to identify security risk and will conduct protective measures in coordination with the supporting cybersecurity service provider organization for the CDES and CDES environment in accordance with DoD Instruction 8500.01, DOD Instruction (DODI) 8540.01 and US Cyber Command orders and directives (e.g., alerts or tasking orders)

Metrics and Performance Indicators:

Cost: TBD by DISA

Schedule: FY25, Q1 through FY26, Q4

Performance: Cloud-based architecture supports ESC-MC tools as part of the overall ESC-MC CONOPS

Metrics: Approved data management architecture

3.2.3   Implement the DoD ESC-MC Integrated Data architecture

3.2.3.1   *Establish and sustain data catalogues for ESC-MC RA defined and available ESC-MC Services and service-providers, terminal registration, and SA/COP reporting*

OPR: USSF   OCR: DISA, USSPACECOM, C-SSEs and JS J6

Capability Area: 3.0 Enterprise Situational Awareness Common Operating Picture (SA/COP)

Capability Upgrade: CU-2, Data Management and CDES

References: DoD Data Strategy

Description: USSF coordinate with DISA, USSPACECOM and C-SSEs to establish and sustain data catalogues for ESC-MC RA defined and available ESC-MC Services and service-providers, terminal registration, and SA/COP reporting. The data catalogues will be available to ESC-MC solution developers for consistency and promote seamless capability integration into the overall ESC-MC architecture.

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Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY25, Q1 through FY26, Q3

Performance: Data catalogues available to ESC-MC solution developers

Metrics: Approved data catalogues; compliant use by ESC-MC solution developers.

3.2.3.2   *Rationalize the various ESC-MC databases into a single database management environment*

OPR: DISA   OCR: USSF, USSPACECOM, C-SSEs and Joint Staff J6

Capability Area: N/A

Capability Upgrade: CU-2, Identify authoritative data catalogues

References: DoD Data Strategy

Description: DISA rationalize the various ESC-MC databases (JSME/SDB/SATCOM User Requirements Repository, DoD SATCOM Blue Order of Battle, etc.) into a single database management environment to include the use of previously established UDL, data management architecture, and data catalogues.   Database management environment will comply with guidance from the DoD Chief Data Officer.

Metrics and Performance Indicators:

Cost: TBD by DISA

Schedule: FY24, Q4 through FY26, Q4

Performance: Database management environment supports ESC-MC CONOPS

Metrics: Data base management environment operationally available

3.2.3.3   *Establish and sustain data-driven, policy-based rules implementation for enabling automated resource allocation (SATCOM Network Access Process)* (dependency on Task 3.3.1.4)

OPR: DISA   OCR: USSF, USSPACECOM, C-SSEs and JS J6

Capability Area: 4.0 Automated Resource Allocation

ESC-MC Implementation Plan

Capability Upgrade: CU-3, Reduced Service Request Lead-time

References: DoDI 8420.02 and CJCSI 6250.01

Description: DISA will coordinate with the Joint Staff J6, USSPACECOM and C-SSEs to establish and sustain data-driven, policy-based rules implementation for developing and enabling automated resource allocation (SATCOM Network Access Process) with the intent of consolidating all SATCOM service requests (e.g. SARs, GARs, GMRs, PMRs) and all network requests (e.g. GARs, GAIT requests, ADNS requests) into a single SATCOM Network Access Process (SNAP) driving fulfillment times from days to hours and eventually minutes. SNAP will accommodate element-level M&C and take into account the unique ADNS processing. These policy based rules should also enable the use of commercially provided SATCOM Services.

Metrics and Performance Indicators:

Cost: TBD by DISA

Schedule: FY23, Q3 through FY25, Q2

Performance: Warfighter network access requests fulfilled per timelines in the JSCL ICD

Metrics: Less than 1 minute for SATCOM terminal registering and less than 10 minutes for SATCOM terminal provisioning

3.2.3.4 Define and implement Cybersecurity/Risk Management Framework (RMF) measures to protect legacy and future elements of the DoD SATCOM enterprise from cybersecurity threats while enabling remote monitoring and control

OPR: USSF   OCR: USSPACECOM and JFHQ DODIN

Capability Area: 3.0 ESC-MC enterprise SA/COP

Capability Upgrade: CU 4 - Test and Implement Core Enabling Services

References: DoDI 8510.01

Description: United States Space Force in coordination with Joint Force Headquarters DoD Information Networks (JFHQ DODIN) define and implement Cybersecurity/RMF Measures to Protect Legacy elements of the DoD SATCOM enterprise from Cybersecurity Threats while Enabling Remote Monitoring and Control.   Implementation of Cybersecurity/RMF Measures will be consistent with the Cybersecurity Reference Architecture (CSRA). The cybersecurity posture will identify Key Terrain in Cyberspace

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and provide focused situational awareness across enterprise SATCOM to rapidly detect and respond to anomalous activity using advanced mission-focused analytics and decision support tools (DST). The Cybersecurity posture should support the requirements of the Authorizing Officials for each major subsystem or element of ESC-MC.

Metrics and Performance Indicators:

> Cost: TBD by USSF

> Schedule: FY25, Q1 through FY26, Q4

> Performance: ESC-MC and its component capabilities postured for protection from cybersecurity threats

> Metrics: Compliance with the CSRA

3.2.4   Establish and Sustain Capability 2.0--Management Common Operational Environment

3.2.4.1   Design and implement the Cross-Domain Enterprise Services (CDES), inclusive of Vendor Extension Areas, needed to enable the appropriately protected sharing of information among DoD enterprise SATCOM elements and with International Partners

OPR: DISA   OCR: NSA

Capability Area: 2.0 Management Common Operating Environment (COE)

Capability Upgrade: CU 2 – Data Management and CDES

References: DoDI 8540.01

Description: DISA design, implement, and sustain the Cross-Domain Exchange Services (CDES), inclusive of Vendor Extension Areas, that are needed to enable the appropriately protected sharing of information among the various elements of the hybrid, heterogeneous elements comprising the DoD SATCOM enterprise--which operate across a full range of different security domains to include domains accessible by allies and international and coalition partners. CDES solutions will be NSA accredited and support the ESC-MC data management architecture.

Metrics and Performance Indicators:

> Cost: TBD by DISA

> Schedule: FY24, Q1 through FY25, Q2

Performance: Seamless information sharing across all boundaries of the SATCOM enterprise

Metrics: CDES operationally available

3.2.4.2 Provision, establish, and sustain a Management Common Operational Environment (COE) for all stakeholders participating in DoD's enterprise satellite communications capability set and the supporting, relevant capability requirements from the JSCL ICD (enterprise operational management).

OPR: DISA   OCR: USSPACECOM, Services

Capability Area: 2.0 Management Common Operating Environment (COE)

Capability Upgrade: CU 1 – COE

References: DoD Directive 5105.19 and JSCL ICD

Description: DISA provision, establish, and sustain a Management Common Operational Environment (COE) for all stakeholders participating in DoD's enterprise Satellite Communications capability set and the supporting, relevant capability requirements from the JSCL ICD (enterprise operational management.)   The Management COE will leverage enterprise- and element-level databases in an integrated fashion, and access-identity control, to support rules-based, policy implementation and FCAPS framework management of: Planning, network/resource management, Payload/GW/Terminal control, key distribution, and Quality of Service (QoS) implementation.   Where practical, the Management COE should employ web-based access to facilitate ease of access and transportability.

Metrics and Performance Indicators:

Cost: TBD by DISA

Schedule: FY24, Q1 through FY26, Q4

Performance: Warfighter and SATCOM stakeholder Identification-based access to web-based COE for operations of the ESC-MC capability

Metrics: COE operationally available

3.2.4.3 Plan, execute, and sustain service delivery and hosting (to include schedule) of the services identified in the CV-7 (table 4) of the Enterprise SATCOM M&C Reference Architecture (ESC-MC Reference Architecture).

OPR: DISA   OCR: USSPACECOM, Services

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Capability Area: N/A

Capability Upgrade: CU 1 through CU 4

References: DoD Directive 5105.19

Description: DISA plan, execute, and sustain service delivery and hosting (to include schedule) of the services identified in the CV-7 (table 4) of the Enterprise SATCOM M&C Reference Architecture. Hosted Services may include COTS, formal development and agile development products and include: 1.0 Integrated Data Storage Management, 1.1 Enterprise Terminal/User Service Catalogues, 2.0 Provide SA Information, 2.1 Subscribe to SA Information, 2.2 Unsubscribe to SA Information, 3.0 Enterprise Network Management to Element Management Communications, 3.1 Enterprise network management operational support system (OSS), 3.2 Enterprise network management business support system (BSS), 3.3 Cross Domain Enterprise Service (CDES), 4.0 Identity and Access Management Services, 5.0 Enterprise SATCOM modeling and analytics, 6.0 SATCOM Network Access Control (NAC), and 7.0 Multi-Commercial SATCOM Service Provider Network Element Management (NEM) service.

Metrics and Performance Indicators:

Cost: TBD by DISA

Schedule: FY24, Q1 through FY28, Q1

Performance: ESC-MC operates as intended in the CONOPS

Metrics: Service delivery and operational availability

3.2.4.4 *Create and sustain a Plan of Actions and Milestones (POA&M) for creating an enterprise-wide terminal-modem registration process and a terminal/modem resource allocation process*

OPR: USSF   OCR: USSPACECOM, C-SSEs, DISA, CIO, Service
                                                          Component Terminal Program Offices

Capability Area: 3.0 ESC-MC Enterprise SA/COP

Capability Upgrade: CU 1 – COE

References: ESC-MC Reference Architecture

Description: USSF create and sustain a Plan of Actions and Milestones (POA&M) for creating an enterprise-wide Terminal-Modem Registration process and a Terminal-

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Modem resource allocation process. The vision is to create a band-agnostic capability, however, USSF will consider the MUOS WCDMA processes for terminal provisioning, registering and network access. Terminal-Modem registration is the process by which terminals/modems register and are learned by the enterprise SATCOM Management COE and supports user terminal/modem initiation and registration (includes role-based policy implementation) within 1 minute. Terminal provisioning is the process by which a terminal/modem receives software and security policy updates and supports transfer of software/security updates within 10 minutes. USSF, in coordination with the C-SSEs and Services, will determine the number of terminals requiring simultaneous processing for both registration and updates and pass that information to DISA and USSF for incorporation into ESC-MC solutions. The plan should also address how to process multi-channel terminals/modem. Finally, the plan should address how to accommodate terminals acquired as part of a commercially provided service and whether those terminals are part of the information in the Service Provider's VEA or whether the terminals provide data directly to ESC-MC processes.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY23, Q2 through FY26, Q3

Performance: N/A

Metrics: POA&M delivery

3.2.5 Establish and Sustain Capability 7.0--Enterprise-Element Interface Standard

3.2.5.1 Develop and publish ESC-MC interface standards

OPR: USSF   OCR: DISA, DoD CIO, USSPACECOM, Services

Capability Area: 7.0 Enterprise - Element Network Interface

Capability Upgrade: CU 2 - Data Management and CDES

References: DoD Directive 5105.19

Description: USSF will determine the open interface standards that enable the operational and business support information exchange required by the hybrid, heterogeneous satellite network enterprise to meet USSPACECOM fighting SATCOM requirements. This OSS/BSS exchange must include policy/rules definition, SA/COP information (to include specific system monitoring and reporting) requirements,

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SLA/billing and other network logistics, loss of M&C contingencies, network engineering and planning, and other specified system to system communications to include those from the SATCOM terminal and ground infrastructure segments. Identified standards will be processes through DISA's SATCOM Interoperability and Standards Committee (SISC).

Metrics and Performance Indicators:

      Cost: TBD by USSF

      Schedule: FY23, Q2 through FY25, Q3

      Performance: N/A

      Metrics: Standards adopted by SISC

3.2.5.2   Develop/adopt and publish sensing and "out of band" architecture standards.

OPR: USSF   OCR: DISA, DoD CIO, USSPACECOM, Services

Capability Area: 3.0 ESC-MC Enterprise SA/COP

Capability Upgrade: CU 3 -- Reduced Service Request Lead-time

References: CJCSI 6250.01 and SISC Charter

Description: USSF develop/adopt and publish sensing and "out of band" architecture standards. Identified standards will be processes through DISA's SATCOM Interoperability and Standards Committee (SISC).

Metrics and Performance Indicators:

      Cost: TBD by USSF

      Schedule: FY24, Q2 through FY26, Q1

      Performance: N/A

      Metrics: Standards adopted by SISC

3.2.5.3   Establish a plan for enterprise SATCOM heterogeneous Interoperability and the supporting, relevant capability requirements from the Joint Space Communications Layer Initial Capabilities Document (JSCL-ICD)

OPR: USSF   OCR: DISA, DoD CIO, USSPACECOM, Services

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Capability Area: 7.0 Enterprise - Element Network Interface

Capability Upgrade: CU 4 -- Test & Implement Core Enabling Services

References: CSO Vision for Satellite Communications (SATCOM) and JSCL ICD

Description: United States Space Force establish a plan for enterprise SATCOM heterogeneous Interoperability for ESC-MC across MILSATCOM and COMSATCOM orbits and spectrum. The plan should include the necessary interfaces to exchange ESC-MC information (OSS/BSS) between enterprise and element M&C networks via designated open information exchange standards and the ability for SATCOM terminals to implement the necessary interfaces to facilitate situational awareness at both the element and enterprise M&C levels. The plan should also address the ES-MC requirements in the JSCL ICD

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY23, Q3 through FY25, Q2

Performance: N/A

Metrics: Published ESC-MC heterogeneous interoperability plan

3.2.5.4 Establish plan for enterprise SATCOM hybrid interoperability and information exchange with USSF DoD COMSATCOM acquisition initiative

OPR: USSF   OCR: DISA, USSPACECOM, Services

Capability Area: 7.0 Enterprise - Element Network Interface

Capability Upgrade: CU 4 -- Test & Implement Core Enabling Services

References: CSO Vision for Satellite Communications (SATCOM) and JSCL ICD

Description: USSF establish plan for enterprise-level M&C for DoD SATCOM to support communications interoperability across a mix of different kinds of SATCOM solutions (including: MILSATCOM, COMSATCOM, and SATCOM Ground Infrastructure; different orbits; different frequency bands; satellites and gateways operated by same or different organizations, whether within or outside the DoD). The plan should encompass (a) defining and establishing interfaces necessary to exchange SATCOM management and control (M&C) information; (b) business support system (BSS) and operations support system (OSS) kinds of information, and (c) interfaces between enterprise-level and a

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subordinate element-level COMSATCOM M&C system, as outlined in tasks 3.1.2.1 through 3.1.2.4. These interfaces should support designated open information exchange standards and Vendor Extension Areas (VEA) for protection of proprietary information.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY24, Q3 through FY26, Q2

Performance: N/A

Metrics: Published ESC-MC hybrid interoperability plan

3.3. Automate Resource Allocation Imperative

3.3.1 Establish and Sustain Capability 4.0--Automated Resource Allocation

3.3.1.1 Design and implement preplanned and on-demand SATCOM resource allocation options for selecting service-provided options based on the available services catalogue

OPR: USSF   OCR: DISA, C-SSEs, and RSSCs

Capability Area: 1.0 Mobility and Continuous Communications

Capability Upgrade: CU 3 - Reduced Service Request Lead-time;   and CU 5 – Validate Core Enabling Capabilities

References: CSO Vision for Satellite Communications (SATCOM)

Description: United States Space Force design and/or procure/lease existing commercial software to determine enterprise-wide resource allocation options and eventually provide visibility of those options through the purpose-built ESC-MC SA/COP tools. It is intended for element-level M&C organizations to execute those options, but maximize DoD and industry collaboration through use of common planning tools and data sharing.   The plan will accommodate both pre-planned and on-demand SATCOM missions. Pre-planned missions are based on known or predicted user resources.   For on-demand missions the intent is to select the optimal solution based on more immediate user needs/constraints and as further dictated by user location and equipment and SATCOM resources.

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Metrics and Performance Indicators:

Cost: N/A

Schedule: FY25, Q1 through FY27, Q4

Performance: N/A

Metrics: Published Resource Allocation Plan

3.3.1.2 Create a detailed plan for achieving an integrated SATCOM NAR-NAA process as part of SNAP

OPR: USSPACECOM J3   OCR: C-SSEs, DISA, Services

Capability Area: 2.0 Management COE

Capability Upgrade: N/A

References: Unified Command Plan and CJCSI 6250.01

Description: USSPACECOM J3 create a detailed plan for integrating the new SNAP into the overall SATCOM ESC-MC capability. The plan should address how to integrate element SATCOM management systems (MILSATCOM, COMSATCOM, International Partners, Ground Infrastructure, and non-SATCOM DODIN infrastructure) and address the necessary authorities, policy rules and associated data/information flows.

Metrics and Performance Indicators:

Cost: TBD by USSPACECOM

Schedule: FY24, Q2 through FY25, Q2

Performance: N/A

Metrics: Published NAR/NAA Integration plan

3.3.1.3 Execute the plan for achieving an integrated SATCOM NAR-NAA process as part of SNAP

OPR: USSPACECOM J3   OCR: C-SSEs, DISA, Services

Capability Area: 2.0 Management COE

Capability Upgrade: CU 2 -- Data Management and CDES

References: Unified Command Plan and CJCSI 6250.01

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Description: USSPACECOM J3 execute the integrated SATCOM NAR/NAA processes as part of SNAP to move users to the optimally available SATCOM systems dependent on the user location, equipment, threats, and business and operational factors.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY25, Q3 and continuously thereafter

Performance: Operational Availability of SATCOM services and ability to move SATCOM users between systems

Metrics: N/A

3.3.1.4   Establish and sustain policy rules for SATCOM NAR validation (to be loaded into the SNAP automated rules implementation) (supports Task 3.2.3.3)

OPR: USSPACECOM J3   OCR: C-SSEs, DISA, CCMDs, Services

Capability Area: 4.0 Automated Resource Allocation

Capability Upgrade: CU 3 -- Reduced Service Request Lead-time

References: Unified Command Plan and CJCSI 6250.01

Description: United States Space Command capture the policy rules for individual SATCOM element manager's Network Access Request/Network Access Authorization processes. USSF and USSPACECOM J3 will use the policy rules to accomplish tasks 3.3.1.5 through 3.3.1.7

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY23, Q4 through FY25, Q2; Every 2 years thereafter

Performance: Rule sets enable automated shifting of users between SATCOM elements

Metrics: N/A

3.3.1.5   Implement the policy rules enabling scheduling and validation of SATCOM NAR/NAA missions in SNAP among available element service providers.

OPR: USSPACECOM J3   OCR: DISA, C-SSEs and Services

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Capability Area: 4.0 Automated Resource Allocation

Capability Upgrade: CU 5 -- Validate Core Enabling Capabilities

References: Unified Command Plan and CJCSI 6250.01

Description: USSPACECOM J3 in coordination with the C-SSEs, execute the policy rules necessary to schedule and validate user SATCOM network access request/SATCOM network access authorizations (SATCOM NAR/NAA) as consolidated in the called for SATCOM Network Access Process (SNAP) among SATCOM element management systems including COMSATCOM, MILSATCOM, International Partner, SATCOM Ground Infrastructure, and DODIN elements. Enterprise-level SATCOM M&C will posture its operators to assign users to the optimally available SATCOM system, or combination of SATCOM solution elements, indirectly leveraging the appropriate element M&C capability(ies) using that systems element manager.

Metrics and Performance Indicators:

Cost: N/A

Schedule: FY25, Q3 and continuously thereafter

Performance: SNAP executed automatically for selected SATCOM element management systems

Metrics: N/A

3.3.1.6   Establish the plan for enabling the ESC-MC services needed to facilitate users rapidly and effectively shifting their SATCOM support from one element of the SATCOM enterprise to another.

OPR: USSPACECOM J3   OCR: DISA, C-SSEs, RSSCs, Services

Capability Area: 4.0 Automated Resource Allocation

Capability Upgrade: CU 5 -- Validate Core Enabling Capabilities

References: Unified Command Plan and CJCSI 6250.01

Description: USSPACECOM J3 establish the plan for integrating SATCOM element management systems into the overall ESC-MC capability and specifically the SA/COP to support the ESC-MC CONOPS.   The plan will serve as the basis for tasks 3.3.1.7 and 3.3.1.8.

Metrics and Performance Indicators:

Cost: TBD by USSPACECOM

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Schedule: FY23, Q3 through FY25, Q1

Performance: N/A

Metrics: Published SATCOM element management system integration plan.

3.3.1.7 Enable the ESC-MC element managers to orchestrate users being able to smoothly and rapidly shift their SATCOM support from one element of the SATCOM enterprise to another.

OPR: USSF   OCR: USSPACECOM J3, Services, C-SSEs, RSSCs, DISA

Capability Area: 4.0 Automated Resource Allocation

Capability Upgrade: CU 3 -- Reduced Service Request Lead-time

References: CSO Vision for Satellite Communications (SATCOM)

Description: United States Space Force design the capability to enable the individual SATCOM element management systems to support the ESC-MC capability. Individual SATCOM element management systems should provide the necessary information to the ESC-MC SA/COP to determine the optimal system availability for warfighters.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY24, Q3 through FY25, Q3

Performance: Element managers integrated into the overall ESC-MC capability

Metrics: N/A

3.3.1.8 Complete and validate the services necessary to provide for ESC-MC orchestrated, rapid and responsive shifts between elements of the SATCOM enterprise.

OPR: USSF   OCR: USSPACECOM J3, Services, DISA

Capability Area: 4.0 Automated Resource Allocation

Capability Upgrade: CU 5 -- Validate Core Enabling Capabilities

References: CSO Vision for Satellite Communications (SATCOM)

Description: United States Space Force complete the necessary services to enable ESC-MC orchestrated rapid and responsive shifts between elements of the SATCOM

enterprise and USSPACECOM J3 validate those services support the ESC-MC CONOPS. USSF SSC will identify the necessary services to DISA for hosting, where appropriate. DISA will host those services and ensure there is a COOP for infrastructure hosting those services.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY25, Q1 through FY26, Q4

Performance: Warfighters, with consideration for location and equipment, can transition rapidly from one SATCOM element to another.

Metrics: Transition time in XX minutes between SATCOM elements as defined by USSPACECOM J3

3.3.2 Complete Capability 1.0--Mobility and Continuous Communications

3.3.2.1 *Coordinate, design and implement an automated service provider hand-off capability to facilitate automated transfer of SATCOM platforms and networks within and between element management systems*

OPR: USSF   OCR: USSPACECOM J3, C-SSEs, DISA, Services

Capability Area: 1.0 Mobility and Continuous Communications

Capability Upgrade: CU 4 -- Test & Implement Core Enabling Services

References: CSO Vision for Satellite Communications (SATCOM)

Description: United States Space Force coordinate, design, and implement an automated service provider hand-off capability to facilitate automated transfer of SATCOM platforms and networks within and between element management systems. The automated transfer system should use SA/COP information to determine available options based on the user/equipment profile and recommend the optimal and executable option for automated transfer.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY24, Q1 through FY25, Q4

Performance: Warfighter's ability to change SATCOM use from one system to another based on location and equipment

Metrics: Published ESC-MC hybrid interoperability plan

3.3.3 Establish and Sustain Capability 6.0--Continuity of Operations

3.3.3.1 *Provide Continuity of Operations (COOP) capability for ESC-MC Data in core data centers and in the cloud environment.*

OPR: DISA   OCR: USSPACECOM J3

Capability Area: 6.0 Continuity of Operations

Capability Upgrade: CU 5 - Validate Core Enabling Capabilities

References: DoD Directive 5105.19

Description: DISA, in coordination with USSPACECOM J3, establish COOP capability within the Core Data Center/Cloud environment to support initial and final COOP capabilities as defined in the ESC-MC Reference Architecture Capability Objectives CV-2. While USSPACECOM coordinates with USSF as the solution provider and DISA as the host of ESC-MC services to design an overall COOP capability for ESC-MC, DISA should have its own COOP capability for DISA's hosting infrastructure.

Metrics and Performance Indicators:

Cost: TBD by DISA

Schedule: FY25, Q2 through FY27, Q2

Performance: Data continuously available for ESC-MC capabilities and during COOP procedures for those ESC-MC Capabilities.

Metrics: Operational availability

3.3.3.2 *Develop the Procedures and identify any additional functional capabilities required to ensure the Continuity of Operations (COOP) of the ESC-MC Management Common Operational Environment for all users of the SATCOM enterprise.*

OPR: USSPACECOM J3   OCR: DISA, C-SSEs, Services

Capability Area: 6.0 Continuity of Operations

Capability Upgrade: N/A

References: Unified Command Plan and CJCSI 6250.01

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Description: USSPACECOM, in coordination with DISA and the C-SSEs will develop the procedures necessary to ensure COOP of the Management COE and underlying functional capabilities. DISA will host and provide continuous operational functionality of those ESC-MC capabilities designated as critical components/key terrain in cyberspace and restoral of normal control system state as rapidly as possible following a disruptive event. COOP should include the ability to flex operations of SATCOM EM&C to multiple pre-designated locations as well as the ability to rapidly stand up SATCOM EM&C at ad-hoc locations.

Metrics and Performance Indicators:

Cost: TBD by DISA

Schedule: FY24, Q2 through FY25, Q2

Performance: Ability to COOP without interruption to pre-designated locations and Ability to COOP within XX hours/days to ad-hoc locations

Metrics: Classified.

3.4   Fuse Situational Awareness Imperative

3.4.1   Establish and Sustain capability 3.0--Enterprise SA/COP

3.4.1.1   *Validate Situational Awareness / Common Operational Picture (SA/COP) informational requirements for ESC-MC*

OPR: Joint Staff J6   OCR: USSPACECOM, C-SSEs, RSSCs, Combatant Commands, Services, DISA

Capability Area: N/A

Capability Upgrade: N/A

References: CJCSI 6250.01

Description: Joint Staff J6 will work with USSPACECOM, C-SSEs, RSSCs and other Combatant Commands and Services, validate, and document the requirements for the ESC-MC SA/COP. Joint Staff J6 will pass those requirements to DISA and USSF for sourcing authoritative ESC-MC SA/COP data.

Metrics and Performance Indicators:

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      Cost: N/A

      Schedule: FY23, Q4 through FY25, Q4

      Performance: Requirements identified, validated and documented.

      Metrics: N/A

3.4.1.2 Establish authoritative data sources for SA informational requirements defined by the CJCS. (Spectrum/EMI, link outages, cybersecurity events)

OPR: USSF   OCR: DISA, DoD Chief Data Officer, USSPACECOM, and C-SSEs

Capability Area: 3.0 Enterprise SA/COP

Capability Upgrade: CU 2 - Data Management and CDES

References: DoD Data Strategy and ESC-MC Reference Architecture

Description: USSF in coordination with DISA, USSPACECOM and C-SSEs, will identify authoritative data sources to meet the ESC-MC SA/COP requirements as identified by the Joint Staff. DISA will include those sources within the overall ESC-MC data management plan and catalogues.

Metrics and Performance Indicators:

      Cost: TBD by DISA

      Schedule: FY23, Q4 through FY24, Q4

      Performance: Authoritative data sources integrated into the overall ESC-MC data management plan and data catalogues.

      Metrics: Authoritative data sources identified for all Joint Staff validated ESC-MC SA/COP requirements

3.4.1.3 Establish, employ, and sustain Situational Awareness (SA) monitoring and reporting tools

OPR: USSF   OCR: DISA, USSPACECOM

Capability Area: 3.0 Enterprise SA/COP

Capability Upgrade: CU 2 - Data Management and CDES

References: CSO Vision for Satellite Communications (SATCOM)

ESC-MC Implementation Plan

Description: United States Space Force will coordinate with the USSPACECOM to establish priorities for delivering Situational Awareness monitoring and reporting tools for the SATCOM SA/COP in support of the ESC-MC CONOPS. Priorities will align with the seven core functions of the ESC-MC Reference Architecture. Monitoring and reporting tools will enable the execution of ESC-MC and "Fighting SATCOM" CONOPS. USSPACECOM will identify necessary data to support the tools and DISA will incorporate that data into the overall ESC-MC Data Management Plan.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY23, Q4 through FY26, Q4

Performance: USSF delivers tools in response to USSPACECOM established priorities and timelines.

Metrics: Data for tailorable SA/COPs available to SIOD, element managers, and other SATCOM stakeholders as necessary.

3.4.1.4 *Provide tailorable queries of SATCOM Situational Awareness (SA) monitoring to support user-defined SA reports*

OPR: DISA   OCR: USSPACECOM, USSF, C-SSEs, RSSCs

Capability Area: 3.0 Enterprise SA/COP

Capability Upgrade: CU 1 -- COE

References: CSO Vision for Satellite Communications (SATCOM)

Description: DISA will enable identity/role-based queries to SATCOM SA data to give SATCOM Stakeholders the ability to create user-defined SA reports. DISA will ensure the data remains secure and unchanged to ensure consistency across the SATCOM enterprise.

Metrics and Performance Indicators:

Cost: TBD by DISA

Schedule: FY26, Q1 and continuously thereafter

Performance: ESC-MC Situational Awareness data available to authorized users

Metrics: N/A

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3.4.1.5 *Provide tailored SATCOM modeling and analytics for operations impact from electromagnetic interference (EMI), authorized service interruptions (ASI), loss of node(s), operations plans (OPLANS) support, and analysis of alternatives (AoAs) to support user-defined common operational picture "dashboards" and key performance indicators (KPIs)*

OPR: USSF OCR: USSPACECOM, SIOD, C-SSEs, RSSCs, and DISA

Capability Area: 3.0 Enterprise SATCOM Situational Awareness/Common Operational Picture (SA/COP)

Capability Upgrade: CU 2 - Data Management and CDES

References: CSO Vision for Satellite Communications (SATCOM)

Description: United States Space Force will make ESC-MC related data available in the form of tailored modeling and analytics appropriate to the ESC-MC CONOPS. Modeling should use Defense Planning Guidance (DPG) scenarios for operational context. USSF will make USSPACECOM's SATCOM SA/COP dashboard segments available to SATCOM stakeholders to build user-defined dashboards to support their individual SATCOM missions. This task will ensure all SATCOM stakeholders are viewing consistent information throughout the SATCOM enterprise.

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY24, Q3 through FY26, Q3

Performance: Tailored modeling and analytical data available to key SATCOM stakeholders

Metrics: percentage of DPG scenarios and threats modelled

3.4.2 Complete Capability 5.0--Blue & Grey Force EMI Mitigation

3.4.2.1 *Establish and execute a plan for ingesting the necessary rules-based spectrum monitoring reporting into the ESC Management COE for the SA/COP data catalogue.*

OPR: USSF OCR: CFSCC, USSPACECOM J3, C-SSEs, RSSCs and DISA

Capability Area: 5.0 Blue and Grey Force EMI Mitigation

Capability Upgrade: N/A

References: DoD Directive 3610.01

ESC-MC Implementation Plan

Description: United States Space Force establish and execute a rules-based plan for ingesting the necessary spectrum monitoring reporting, including from the ITU Management Tool, into the ESC Management COE for the SA/COP data catalogue. The end result should allow for the creation of a Blue Force Spectrum Order of Battle as a baseline and the ability to detect, identify, and mitigate/resolve Blue/Grey Force EMI against that baseline as adjudicated by the Combined Force Space Component Command (CFSCC).

Metrics and Performance Indicators:

Cost: TBD by USSF

Schedule: FY23, Q4 through FY24, Q3

Performance: Planned and authorized spectrum documented and available to the SA/COP with the ability to detect Blue/Grey Force EMI.

Metrics: Spectrum Blue Order of Battle and Blue/Grey Force EMI detection/identification available to the SA/COP

3.4.2.2 *Employ the DoD SATCOM Blue Order of Battle to facilitate SIOD EMI mitigation operations*

OPR: CFSCC   OCR: USSPACECOM J3, C-SSEs, RSSCs, Services

Capability Area: 5.0 Blue and Grey Force EMI Mitigation

Capability Upgrade: CU 5 - Validate Core Enabling Capabilities

References: DoD Directive 3610.01

Description: Combined Force Space Component Command (CFSCC) employ the DoD SATCOM Blue Order of Battle to facilitate SIOD, C-SSE's, and RSSC's EMI mitigation operations. The Blue Order of Battle for spectrum operations establishes the baseline necessary to execute the Blue/Grey EMI Force EMI plan to include restoral to normal operations.

Cost: N/A

Schedule: FY24, Q3 and continuously thereafter

Performance: Warfighters document and adhere to spectrum planning and authorizations

Metrics: N/A (Metric will be measured in the Blue/Grey Force EMI plan)

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3.4.2.3 Execute the plan for identifying instances of Blue/Grey/Red Force EMI and reporting it to the affected users.

OPR: CFSCC   OCR: USSPACECOM J3, C-SSEs, RSSCs, and Services

Capability Area: 5.0 Blue and Grey Force EMI Mitigation

Capability Upgrade: CU 2 - Data Management and CDES

References: DoD Directive 3610.01

Description: Combined Force Space Component Command (CFSCC) execute the plan for identifying instances of Blue, Grey, or Red Force EMI and reporting the interference to the affected users. Users are expected to mitigate/resolve/eliminate the EMI in a timely manner and restore communications for normal operations. CFSCC will use Intelligence/Operations Integration (i.e. Adversary On-Orbit Order of Battle (OOB) and Adversary Terrestrial SATCOM Jamming Order of Battle) in its analysis of adversary/red EMI and work with element managers to mitigate impacts and USSPACECOM to resolve or mitigate the EMI and restore communications to normal operations. USSPACECOM will track metrics to determine whether the plan is sufficient to support the ESC-MC CONOPS.

Metrics and Performance Indicators:

Cost: N/A

Schedule: FY23, Q4 through FY26, Q3

Performance: Blue/Grey EMI Plan should reduce the time to mitigate/resolve/eliminate the interference as well as reduce overall instances of Blue/Grey EMI over time

Metrics: Time to resolve Blue/Grey/Red EMI events; tracking of Blue/Grey EMI events per month/quarter/year

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APPENDIX B: REFERENCES

a) Air Force Manual 36-2234, "Instructional Systems Development," November 1, 1993

b) Chairman of the Joint Chiefs of Staff Instruction 5123.01H, "Charter of the Joint Requirements Oversight Council (JROC) and Implementation of the Joint Capabilities Integration and Development System (JCIDS)," August 31, 2018

c) Chairman of the Joint Chiefs of Staff Instruction 6250.01F (G in coordination), "Department of Defense Satellite Communications," February 26, 2019

d) "Charter for Department of Defense (DoD) Command, Control, and Communications Leadership Board (C3LB)," April 16, 2021

e) Deputy Secretary of Defense Memorandum, "Satellite Communications Segment of the DoD Information Network," January 11, 2021

f) DoD Data Strategy, 2020

g) DoD Directive 3610.01, "Electromagnetic Spectrum Enterprise Policy," September 4, 2020

h) DoD Directive 5105.19, "Defense Information Systems Agency (DISA)," July 25, 2006

i) DoD Directive 5144.02, "DoD Chief Information Officer (DoD CIO)," November 21, 2014, as amended

j) DoD Directive 5230.11, "Disclosure of Classified Military Information to Foreign Governments and International Organizations," June 16, 1992

k) DoD Instruction 8310.01, "Information Technology Standards in the DoD," February 2, 2015, as amended

l) DoD Instruction 8330.01, "Interoperability of Information Technology, Including National Security Systems," May 21, 2014 with Change 2 Incorporated December 11, 2019

m) DoD Instruction 8420.02, "Satellite Communications," November 25, 2020

n) DoD Instruction 8510.01, "Risk Management Framework (RMF) for DoD Information Technology (IT)," March 12, 2014, as amended

o) DoD Instruction 8540.01, "Cross Domain (CD) Policy," May 8, 2015 incorporating change 1 August 28, 2017

p) DoD Manual 5200.01, "DoD Information Security Program", February 24, 2012

q) DoD Chief Information Officer Memorandum, "Commercial Satellite Communications Operations Security Guidance," August 8, 2018

r) DoD Digital Modernization Strategy, July 12, 2019

s) DoD Enterprise Satellite Communications Management & Control (ESC-MC) Reference Architecture [report], December 2019

t) Department of Defense "Zero Trust Reference Architecture", April 28, 2021

u) Identity, Credential, and Access Management (ICAM) Reference Design Version 1.0, June 2021

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v) Commercial Satellite Communications Centralized Operational Management (CSCOM) Joint Concept of Operations, October 21, 2015

w) Joint Space Communications Layer (JSCL) ICD, version 1.1, 2016

x) Mission Partner Environment-Information Systems (MPE-IS) Reference Architecture

y) National Defense Strategy, 2018

z) Office of the President of the United States, "Unified Command Plan," January 13, 2021 , as amended

aa) Office of the President of the United States, "Interim National Security Strategy," March 2021

bb) Office of the President of the United States, "National Security Strategy," December 2017

cc) "Satellite Communications (SATCOM) Systems Engineering Group (SSEG) Charter," December 2020

dd) United States Space Command Instruction (SPI) 3250.01A, "Satellite Communications (SATCOM)," May 18, 2020

ee) United States Space Force Vision for Satellite Communications (SATCOM), January 23, 2020

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APPENDIX C: ACRONYMS

ACRONYM	MEANING
AD	authoritative data
ADNS	automated digital network system
ASD	Assistant Secretary of Defense
BSS	business support system
C2	command and control
C2BMC	Command, Control, Battle Management and Communications
C3	command, control, and communications
C4	command, control, communications, and computers
C3LB	Command, Control, and Communications Leadership Board
CCMD	Combatant Command
CDES	cross domain enterprise services
CJCS	Chairman of the Joint Chiefs of Staff
COE	common operating environment
COOP	continuity of operations
COP	common operational picture
COMSATCOM	commercial satellite communications
CDC	core data center
CSO	Chief of Space Operations
CU	capability upgrade
DISA	Defense Information Systems Agency
DoD	Department of Defense
DoD CIO	DoD Chief Information Officer
DoDD	DoD directive
DoDI	DoD instruction
DODIN	DoD information network
DMI EXCOM	Digital Modernization Infrastructure Executive Committee
DMS	Digital Modernization Strategy
E2E	end-to-end
EMI	electromagnetic interference

ESC-MC Implementation Plan

Acronym	Meaning
ESC-MC	enterprise satellite communications management and control
FY	fiscal year
FYDP	future years defense program
GAIT	global agile integrated transport
GAR	gateway access request
GBS	Global Broadcast System
GCCS	Global Command and Control System
GMR	GBS mission request
ICD	initial capability document
IdAM	identity access management
IP	international partner
IPEA	international partner extension area
ISE	integrated SATCOM enterprise
IT	information technology
JCIDS	joint capabilities integration and development system
JEMSO	joint electro-magnetic spectrum operations
JSCL	joint space communications layer
M&C	management and control
MILSATCOM	military SATCOM
MOSA	modular open systems approach
MPE	mission partner environment
MUOS	mobile user objective system
NAC	Network Access Control
NATO	North Atlantic Treaty Organization
NEM	Network Element Management
NIST	National Institute of Standards and Technology
OCR	office of corollary responsibility
OPLAN	operation plan
OPR	office of primary responsibility
OSS	operational support system
PACE	primary, alternate, contingency, emergency

ESC-MC Implementation Plan

Acronym	Meaning
PPBES	Planning, Programming, Budgeting, and Execution System
PBR	President's Budget Request
POA&M	Plan of Actions and Milestones
POM	Program Objective Memorandum
RA	reference architecture
RMF	risk management framework
SA	situational awareness
SA/COP	situational awareness/common operational picture
SAR	satellite access request
SATCOM	satellite communications
SEA	Service extension area
SGII	SATCOM Ground Infrastructure Initiative
SNAP	SATCOM Network Access Process
SOMSAT	SATCOM Ordering Management and Situational Awareness Tool
SSEG	SATCOM Systems Engineering Group
SWAC	Space Warfare Analysis Center
SSIWS	SATCOM Synchronization and Integration Work Shop
UCDMO	Unified Cross Domain Management Office
UCP	Unified Command Plan
UDL	unified data library
U.S.C.	United States Code
USD(A&S)	Under Secretary of Defense for Acquisition and Sustainment
USD(I&S)	Under Secretary of Defense for Intelligence and Security
USD(P)	Under Secretary of Defense for Policy
USD(R&E)	Under Secretary of Defense for Research and Engineering
UAM	user access management
VEA	Vendor Extension Area

ESC-MC Implementation Plan

APPENDIX D: TERMS AND DEFINITIONS

TERM	DEFINITION
access authorization	The formal message sent to assign specific SATCOM resources to authorized users for a specific period of time. An access authorization message includes technical parameters and other information necessary to establish and maintain good order for resource usage.
acquisition and fielding	The process used to obtain and deliver DoD SATCOM resources for operational use, including those resources that enable associated resource allocation and service management capabilities.
adjudication	The appeal process employed as part of the resource allocation functional area that reviews a denied DoD SATCOM request for allocation.
allied partner	Those nations and international organizations (such as NATO) that participate in U.S.-led operations or exercises based on formal or ad-hoc agreements covering joint operations, including, but not limited to, coalition operations.

ESC-MC Implementation Plan

Term	Definition
Blue Order of Battle	The United States order of battle (may include U.S. Allies)
Capability developer/sponsor	A capability sponsor is a Service, Command, or Agency that sponsors the development and/or acquisition and testing of a SATCOM capability to include resourcing. A capability developer is responsible for delivering a capability as defined through JCIDS processes and documentation.
Commercial SATCOM (COMSATCOM)	SATCOM services obtained from commercial entities and operating at frequencies available to those commercial entities.
commercial SATCOM gateway	A SATCOM transmission and receive capability owned by a commercial provider and equipped with SATCOM terminal(s), networking devices, baseband equipment, and transport devices.
communications satellite payload	Space segment SATCOM resource (i.e., communications mission package) that provides beyond-line-of-sight connectivity to provide communications and networking services to and from various points on and around Earth.
configuration management	The administration by a cognizant program manager or designated operations and maintenance lead of orderly and effective procedures, processes, assessments, and changes of hardware or software configuration baselines for SATCOM resources. Includes the planning, design, synchronization, integration, and implementation of configuration changes to SATCOM resources, including facilities, infrastructure, and equipment layout, to achieve SATCOM and terrestrial network operational integrity and interoperability for authorized users. Excludes operational settings required specifically to execute operational tasks related to resource allocation and service management.
Cross domain enterprise services (CDES)	The transfer of data between differing security domains in a secure, consolidated, enterprise environment. CDES, hosted by DISA, provides support to Combatant Commands, Services and Agencies (CC/S/A) by implementing, fielding and providing life cycle support for cross domain solution technologies that provide secure interoperable capabilities throughout the Department of Defense (DoD)

ESC-MC Implementation Plan

TERM	DEFINITION
Data/Data Element	A basic unit of information built on standard structures having a unique meaning and distinct units or values.
Data Catalogue	An organized inventory of data assets in the organization. It uses metadata to help organizations manage their data. It also helps data professionals collect, organize, access, and enrich metadata to support data discovery and governance
Data Integration	The ability to use consume and process authoritative data, data sources, and data catalogues in an efficient and consistent manner
Defense Information Systems Network	The DoD information resources, assets, and processes required to achieve an information advantage and to share information across DoD and with allied partners. It includes: The information itself and the Department's management over the information life cycle; The processes, including risk management, associated with managing information to accomplish the DoD mission and functions; Activities related to designing, building, populating, acquiring, managing, operating, protecting, and defending the information enterprise; and Related information resources such as personnel, funds, equipment, and IT, including internal use software and national security systems.
DoD IE	Comprises DoD-owned and -controlled SATCOM resources, DoD-owned SATCOM resources controlled by non-DoD entities, SATCOM resources acquired by the DoD from commercial providers, and SATCOM resources allocated by the U.S. Government (e.g., Federal, civil SATCOM resources), international partners, or allied partners for DoD use. This definition is independent of any particular state of SATCOM resource allocation, be it to DoD Components or non-DoD entities. SATCOM resources set aside for international partners' use under the terms of a non-equivalent value exchange memorandum of understanding are excluded from this definition.

ESC-MC Implementation Plan

TERM	DEFINITION
DoD SATCOM	A federation of descriptions that provide context and rules for accomplishing the DoD SATCOM mission. These descriptions are developed and maintained at the Department, Capability Area, and Component levels and collectively define the people, processes, and technology required in the "current" and "target" environments, and in roadmaps describing transition to the target environment.
DoD SATCOM enterprise architecture	Describes the DoD SATCOM enterprise top-level management and control system that uses a service-oriented architecture to provide access to DoD SATCOM enterprise IT services (to one or more SATCOM element networks as well as to various pre-defined user/manager accounts) or assists networks with scheduling and requesting resources from another element service provider. Supports the business and operational functions of the seven core DoD ESC-MC capabilities (integrated data storage management, provide SA information, enterprise network management to element management communications, identify and access management services, DoD SATCOM enterprise modeling and analytics, network access control, and multi-vendor network element management service).
DoD Military Satellite Communications (MILSATOM)	DoD SATCOM resources acquired for joint use by DoD Components, including resources acquired by Military Services pursuant to Sections 7062, 8062, 8063, 9062 and 9081 of Title 10, U.S.C., and designated by the acquiring Military Service for joint use. These are allocated through CJCS-defined processes and procedures. They exclude, at the acquiring DoD Component's discretion, COMSATCOM services acquired: Via special acquisition authority. Under CCMDs, Military Services, and Defense Agencies program of record. To support research and development initiatives. For rapid fielding of capabilities to mitigate current challenges and enhance support to CCMDs, Military Services, and Defense Agencies.

ESC-MC Implementation Plan

TERM	DEFINITION
DoD SATCOM enterprise resources	An authoritative federation of descriptions of current and planned DoD SATCOM resources and interface criteria to enable standards-based, interoperable SATCOM resources and integrated network operations as part of the DODIN. They guide and constrain instantiations of DoD SATCOM solution architectures.
DoD SATCOM reference architectures	Frameworks or structures that describe the fundamental organization of a system, embodied in its components, their relationships with each other and the environment, and the principles governing its design and evolution. They are guided and constrained by applicable DoD SATCOM reference architectures and roadmap products.
DoD SATCOM solution architectures	Defined in the DOD Dictionary of Military and Associated Terms.
DODIN	Defined in the DOD Dictionary of Military and Associated Terms.
edge	The reference to a "user" where communications connectivity may be extremely limited, intermittent, and/or available for discreet periods of time
element manager	An organization that manages and controls a segment of the DoD SATCOM enterprise or a capability to which the SATCOM enterprise connected such as high throughput/protected/wideband SATCOM, all-weather/narrowband SATCOM, protected/strategic SATCOM, SATCOM Ground Infrastructure (to include enterprise SATCOM gateways), and non-SATCOM DODIN infrastructure.
enterprise SATCOM gateway	A joint SATCOM transmission and receive capability installed within the boundary of the real property of a Military Department or hosted user facility, equipped with SATCOM terminals, SATCOM modems, networking devices, baseband and encryption equipment, Defense Information Systems Network services and transport devices, and special user transport and managed services to other strategic and tactical SATCOM terminals. Not all enterprise SATCOM gateways will have the entire complement of the aforementioned equipment.

ESC-MC Implementation Plan

TERM	DEFINITION
enterprise service provider	Provides a department-wide service. Examples include DISA as the enterprise service provider for CDES, Global Directory Services, and enterprise E-Mail.
grey force	Allied or friendly force(s)
heterogeneous SATCOM architecture	A SATCOM architecture facilitating user's access to and use of multiple SATCOM capabilities across spectrum bands. Heterogeneous SATCOM architectures may exist within MILSATCOM or COMSATCOM but are optimized in a hybrid SATCOM architecture.
hybrid SATCOM architecture	A SATCOM architecture consisting of both military purpose-built and commercially leased/purchased SATCOM in its entirety or as a service
international partner	A nation that has a current, signed international agreement with the U.S. Government authorizing them to jointly produce, receive, provide, or exchange SATCOM resources with the U.S.
International Partner Extension Area	A distinct protected data enclave containing information on an international partner's (IP) provided SATCOM capability for DoD use as agreed to between the DoD and the IP. The IPEA provides information to the SATCOM SA/COP for resource allocation options.
IT	Defined in Section 11101 of Title 40, U.S.C.

ESC-MC Implementation Plan

TERM	DEFINITION
	Expenditures for IT to address mission delivery and management support. An IT investment may include a project or projects for the development, modernization, enhancement, or maintenance of a single IT asset or group of IT assets with related functionality, and the subsequent operation of those assets in a production environment. All IT investments should have a defined life cycle with start and end dates, with the end date representing the end of the currently estimated useful life of the investment, consistent with the investment's most current alternatives analysis if applicable. When the asset(s) is essentially replaced by a new system or technology, the replacement should be reported as a new, distinct investment, with its own defined life cycle information.
IT Service layer	Segmentation of user requirements by degree of demand stability: Layer 1 – Well-defined, long-term, stable requirements that are largely independent of crisis scenarios and changing OPLANs. Layer 2 – Flexible capacity requirements directly related to DoD strategic plans. This layer focuses on SATCOM capacity over critical geographic theaters and addresses DoD's minimum requirements for intermittent users. Layer 3 – Surge requirements for capacity that might be needed to support crises. These requirements are dynamic, difficult to predict, and may be directly related to world events.

ESC-MC Implementation Plan

TERM	DEFINITION
IT service host	An organization that hosts a capability on behalf of a Service or the entire Department. Examples include DISA data center hosting and MILCLOUD hosting.
Military SATCOM (MILSATCOM)	The SATCOM resources owned and operated by the DoD, primarily in the government frequency bands. MILSATCOM includes those systems (satellites, control segments, user terminals, enterprise SATCOM gateways, and mission-specific SATCOM gateways) owned and operated by the DOD
Mobility and continuous communications	The ability for a SATCOM user to establish and sustain communications in support of operational missions at any location and while in transit.
Network(s)	Defined as either Operations Support System (OSS) Network or Business Support System (BSS) Network. OSS consists of the activities and information technology necessary to operate and sustain an information network. BSS consists of the policies, rules, and functions necessary to deliver an expected/desired outcome or capability.
Network Access Control (NAC)	The act of keeping unauthorized users and devices from gaining access to a network. Conversely, it is also the use of identity and access management in combination with pre-defined role-based activities to ensure only authorized users are on a network and performing pre-defined roles.
Network Element Management (NEM)	The act of managing network (OSS/BSS) resources within a specific system or element
Out of band	That portion of the spectrum while authorized for a particular SATCOM capability is not normally used for transmission of mission information. Out of band spectrum is often used for testing or to provide order wire information for bus or payload control.
red force	Hostile or adversary force(s)
requirements management	The capabilities, processes, and tools that yield detailed insight into current and future DoD SATCOM user requirements and documents those requirements.

ESC-MC Implementation Plan

TERM	DEFINITION
resiliency	The ability of an architecture to support the functions necessary for mission success in spite of hostile action or adverse conditions. An architecture is considered "more resilient" if it can provide these functions with higher probability, shorter periods of reduced capability, or across a wider range of scenarios, conditions, and threats.
resource allocation	The capabilities, processes, and tools that authorize operational use of DoD SATCOM resources consistent with approved user requirements. Includes actions taken to assign power and bandwidth to authorized users, configure communications satellite payloads, and establish operational parameters for use of DoD SATCOM resources.
Role-based Access	The ability to use DISA hosted identity and access management to execute pre-assigned roles in SATCOM tools for the purpose of executing ESC-MC
SATCOM	The use of satellites to provide beyond-line-of-sight communications and networking services (including relay and amplification of data, messaging, video, and voice signals) to and from various points on or around the Earth.
SATCOM gateway	The collective set of enterprise, mission-specific, and commercial SATCOM gateways. SATCOM gateways include resident SATCOM control segment and terminal segment resources.
SATCOM resources	IT resources, including NSS that collectively form and enable the SATCOM segment of the DODIN. SATCOM resources are deployed in all physical warfighting domains (land, maritime air, and space) and perform communications functions in the cyberspace warfighting domain. Includes communications satellite payloads; SATCOM gateways and terminals; communications satellite payload and terminal control systems; and all communications-related systems, capabilities, services, networks, applications, personnel, and funds. When applied to the space segment, the term "SATCOM resources" applies to components that provide communications capabilities (i.e., communications satellite payload) and excludes other spacecraft equipment and systems.

ESC-MC Implementation Plan

TERM	DEFINITION
SATCOM segment of the DODIN	The SATCOM segment of the DODIN comprises the set of all DoD SATCOM resources and is an integral part of the DODIN. The relationships of DoD SATCOM to the DoD IE, the warfighting domains, and the relevant operational mission areas are defined in the January 11, 2021 Deputy Secretary of Defense Memorandum.
Service extension area	Service Extension Areas (SEAs). Similar to the VEAs and IPEAs described above, SEAs will serve to provide the minimum levels of SA (as agreed to between the U.S. and the Service) to incorporate Service-specific non-Joint SATCOM capabilities into the overall ISE. The creation of SEAs will adhere to all cybersecurity requirements protecting both Joint and C/S/A-specific systems.
service management	The capabilities, processes, and tools that manage the operational use of allocated DoD SATCOM resources consistent with an access authorization. Includes monitoring, reporting, and control of the systems and equipment providing those services, including space segment and terminal segment SATCOM resources.
situational awareness	Access to comprehensive and timely fault, configuration, accounting, performance, and security information to inform operational DoD SATCOM resource management (that is, resource allocation and service management).
terminal certification	An evaluation requirement established by the operational community, in coordination with DoD Components responsible for terminal acquisition and fielding, to augment, as necessary, the results of interoperability assessment and testing in accordance with DoDI 8330.01. The process provides the basis for a determination by the operational community and connection approval authorities that DoD SATCOM resources, primarily terminals and modems and associated antennas, radomes, and other radio frequency and intermediate frequency components, will operate with the intended operational SATCOM system in accordance with applicable military standards.

TERM	DEFINITION
user requirement	Individual SATCOM connectivity needs applicable to postulated mission objectives. These are submitted by the user community, recorded in the SURR, and used as a comprehensive catalog of demand that may be applied to specific operational scenarios to inform DoD SATCOM architecture planning and resource allocation.
Vendor extension area (VEA)	A distinct protected data enclave containing information on a commercially provided SATCOM capability for DoD use as agreed to between the DoD and the provider and/or owner/operator. The VEA provides information to the SATCOM SA/COP for resource allocation options.